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MASS DISTRIBUTION OF THE HUMAN BODY USING BIOSTEREOMETRICS

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NOTICES

TECHNICAL REVIEW AND APPROVAL

AMRL-TR-75-18

This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER

CHARLES BATES, JR.
Chief
Human Engineering Division
Aerospace Medical Research Laboratory

AIR FORCE - 27 AUGUST 76 - 200

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As the new field of biostereometrics has become more widely known, the potential to use it for computing mass distribution from body shape and density data has attracted growing interest. Biostereometrics is the spatial and spatio-temporal analysis of biological form and function based on principles of analytic geometry. When applied to humans, it constitutes a modern approach to anthropometry. A suitable stereometric sensor is used to locate the three dimensional coordinates of points distributed over the body surface. The coordinates serve as input to a digital computer which is programmed to yield permutations of numerical or analog (graphical or physical) outputs as the application requires.

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In the present study, stereophotogrammetry was used to obtain stereometric data in the form of Cartesian coordinates of six segmented human cadavers. Density data provided by the contractor (AMRL) were then used in conjunction with the stereometric data to generate mass, volume, center of mass and principal moments of inertia about the principal axes of inertia with the aid of an IBM 360/50 digital computer.

This study was undertaken to further explore the viability of computing mass distribution from biostereometric data and the best available human density values. Only one part of what was a two part sstudy is reported here. Mass distribution of the same six segmented cadavers was determined experimentally in a companion study undertaken by Chandler ***et al.*** (1975). Comparative analysis of the results obtained in the two studies is continuing, but a preliminary examination suggests that the biostereometric and pendulum based measurements of mass distribution correlate very well. If further scrutiny bears out the preliminary findings, the basis for using biostereometrics to compute mass distribution in living humans will have been more firmly established. As more complete and more accurate human density data become available, results based on biostereometric computation can be expected to come even closer to the "true" mass distribution values. With the growing use of digital computers for analytic and simulation purposes rather than simply as a statistical tool, the potential of biostereometrics for generating biomechanical and biomedical parameters warrants further study and implementation where appropriate.

PREFACE

This study was monitored by the Crew Station Integration Branch, Human Engineering Division, Aerospace Medical Research Laboratory (AMRL), Wright-Patterson Air Force Base, Ohio, with support provided under an inter-agency agreement (contract DOT–HS–017–2–315 1A) between the Air Force Systems Command and the Department of Transportation, National Highway Transportation Safety Administration.

The fine working conditions provided by the Civil Aeromedical Institute Federal Aviation Administration, Oklahoma City, Oklahoma, were ideal for the data acquisition phase of this research. We are most grateful to Richard Chandler and his colleagues for their cooperation in helping us adapt so quickly to the unfamiliar surroundings. We also are indebted to Dr. John McConville for making valuable suggestions which undoubtedly improved the final form of this report.

Special thanks are due Charles E. Clauser, Crew Station Integration Branch, who recognized a unique opportunity to compare two rather different methods for obtaining human mass distribution data--the pendulum method of Chandler ***et. al.*** (1975) and the recently developed biostereometric method described in this report. As technical monitor, he also brought to the study a wealth of experience and sympathetic understanding which was instrumental in expediting all phases of the research.

Other members of the Biostereometrics Laboratory staff who contributed to the study were: Mrs. Marj Gordon (data reduction & analysis); Ms. Kathy Hyland (statistical analysis and documentation); Ms. Cheryl Miltenberger (data reduction); Mr. Jack Murphy (photographic processing); Mr. Kenneth Rouk (data acquisition) and Ms. Donna Toups and Mrs. Sherry Gilleland (report preparation). The final report was typed in the Education Office of Texas Institute for Rehabilitation and Research. To all of the above we offer our sincere thanks.

TABLE OF CONTENTS

LIST OF FIGURES

Page

LIST OF COMPUTATIONAL STEPS

LIST OF TABLES

INTRODUCTION

The need for a convenient, accurate and cost-effective method of measuring mass distribution in living humans has been recognized for many years. This deficiency has been re-emphasized in a number of recent reviews, Clauser ***et al.*** (1969), Liu and Wickstrom (1973), Walker ***et al.*** (1973) Chandler ***et al.*** (1975), and Reynolds ***et al.*** (1975). Apart from the obvious academic interest, there is an important practical need for such data in connection with biomechanical and safety studies of transportation systems, the design of artificial limbs and other human welfare-oriented activities. However, traditional methods of measuring body mass distribution generally involve procedures in which the body is subjected to direct physical tests.

When the subjects are living human beings, the range of direct physical tests which can be applied is restricted for reasons of safety and practicability. As a result, most of the human mass distribution data used today is derived from measurements of (mostly male) cadaver specimens. It is therefore of great interest to know the extent to which estimates based on mathematical modeling procedures can be used as an alternative source of information about body mass distribution of men, women and children.

As the new field of biostereometrics has become better known, the potential to compute mass distribution from body shape and density data has attracted growing interest. Biostereometrics is defined as the ***spatial and spatio-temporal analysis of biological form and function based on principles of analytic geometry.***

In a mathematical sense, any surface of the human body can be considered as being comprised of an infinite number of points in three dimensional space (or in four dimensions if we include the dimension of time). It is only necessary to locate enough of these points (distributed over the surface of the body or body parts) using Cartesian or other coordinate systems, to quantify the extension of the body or body part in space or space-time. The feasibility of doing this with the aid of specially-designed stereometric sensors--mechanical, electro-mechanical, optical, electro-optical, photographic, photo-optical and ultrasonic, among others, has been clearly demonstrated (Herron, 1972). The coordinates serve as input to a digital computer, which is programmed to produce relevant information in the form of numerical or analog (graphical or physical) outputs (Fig. 1). For example, the body geometry can be quantified using selected coordinate data points to achieve a desired coverage and accuracy. In a sense, biostereometrics permits us to put the

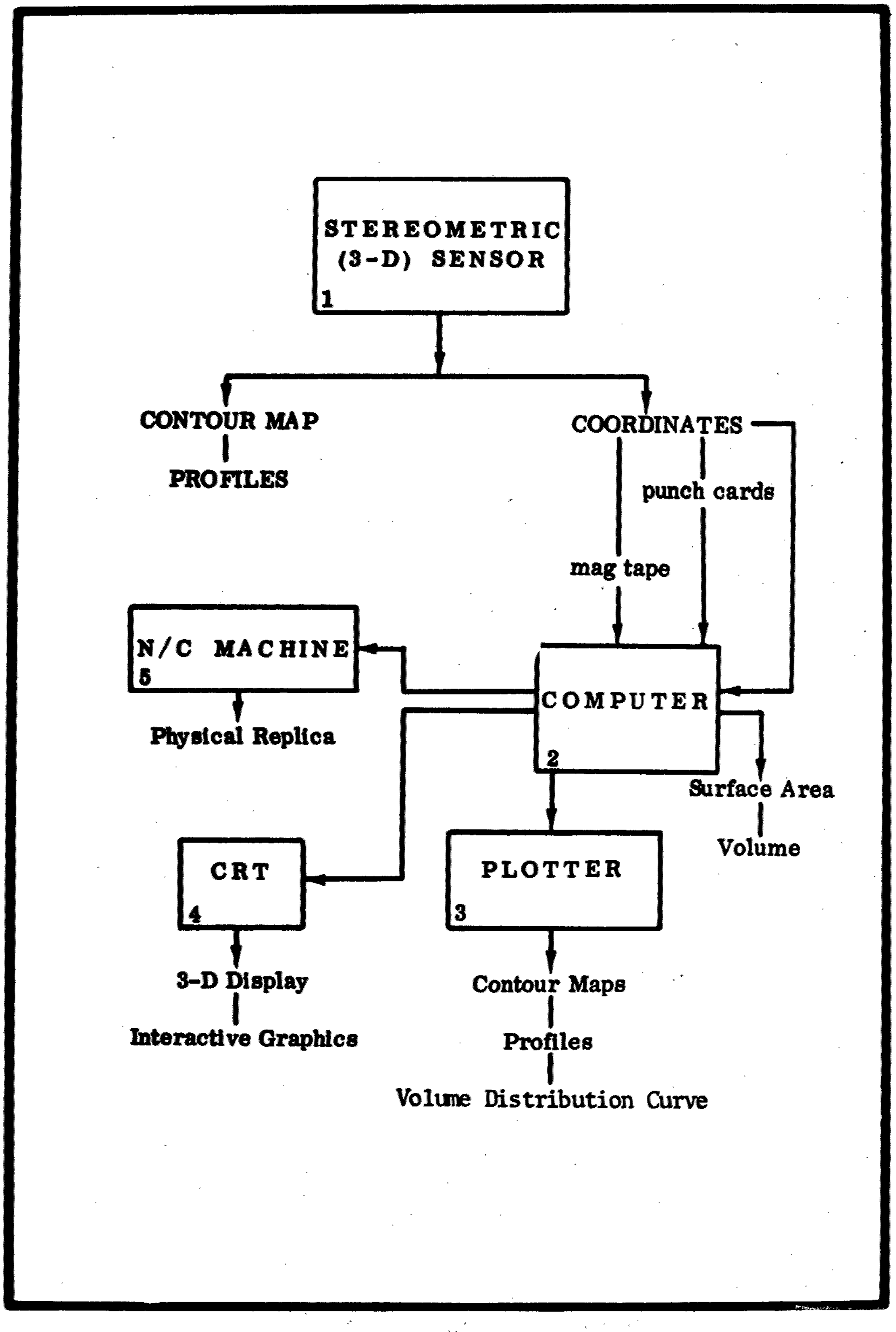


Figure 1 - Biostereometric data processing.

body form into the computer in all its geometric subtlety where it can be thoroughly analyzed, "geometrically dissected," or used as a basis for calculating specific parameters such as mass distribution of the body and its constituent parts.

When stereometric data are used as a basis for computing mass distribution, it is important to note that the accuracy of the results depends not only on the accuracy of the stereometric data, but also on the accuracy of the density values used. This fact should be kept in mind when evaluating the efficacy of using external shape information as a basis for computing mass distribution, especially in the case of a "solid" with a heterogeneous density, such as the human body.

The Present Study

The present study was undertaken at the suggestion of Charles E. Clauser, AMRL. Measurement of mass distribution in a sample of six male cadavers, using the pendulum technique of Chandler ***et al.*** (1975), was already planned to take place at the Civil Aeromedical Institute (CAMI) in Oklahoma City, under the sponsorship of the National Highway Transportation Safety Administration (NHTSA), the Federal Aviation Administration (FAA) and the United States Air Force (USAF). Mr. Clauser, recognizing that this would provide a unique opportunity to compare the two approaches, invited us to calculate the mass properties of the six cadavers using biostereometrics and two sets of density values provided by AMRL. [Clauser ***et al.*** (1969) and Chandler ***et al.*** (1975)]

More specifically, we were asked to compute the mass, volume, location of the center of mass, and the principal moments of inertia about the principal axes of inertia for the six anatomical specimens, as one part of a double blind study. Thus, only the biostereometric method and the associated mathematical computations are described here.

Since cadavers, rather than living humans were used, it is unreasonable to extrapolate to the living without qualification. This matter will be more fully discussed below. Suffice it to mention here that the impossibility of using physical segmenting procedures precludes carrying out a comparative study of this type on living humans. In these circumstances, the present study represents a more practicable means of establishing validity.

Six male cadavers obtained from the Health Sciences Center of the University of Oklahoma, Oklahoma City, comprised the subjects. All six cadavers were examined and found free of congenital anomalies, major surgical alterations, structural atrophy, obesity and gross joint anomalies. The cause of death of one subject was listed as "pulmonary embolism"; in all others death was attributed "to cardiovascular embarrassment." Further details about the six cadavers and the segmentation procedure are given in a companion report (Chandler ***et al.*** 1975).

METHOD

Stereometric Data Collection

A portable data acquisition unit of the Biostereometrics Laboratory was assembled on two occasions at the Civil Aeromedical Institute of the FAA in Oklahoma City, Oklahoma. Six male cadavers obtained from the Health Sciences Center of the University of Oklahoma had been frozen and prepared with lines marked through estimated centers of joint rotation. The first stage of data collection produced stereometric records of the intact cadavers, and the second stage involved photography after segmentation of the cadavers along the marked lines.

The point coordinate data used to compute the specified biomechanical information for the six cadavers were derived from a set of stereophotographs of the 14 body segments after cutting. Stereometric records of the intact cadavers provided the control points used to spatially reconstruct the whole body and to relate the segments one to another and orient their principal axes. In addition, the standing whole body photographs were reduced as an indicator of the method's applicability to living subjects. The techniques used to extract three-dimensional coordinates from the photographic images were similar to those employed in aerial or terrestrial photogrammetry and will be described in a later section of the report.

Marking the Specimen Cadavers

Since the primary spatial data for computing the specified biomechanical parameters were to be derived from photographs of the segments, a means of relating segmental data to the whole body form was devised based on recording marked points to establish the orientation of each segment prior to the cutting. First the coordinate locations of the control points are measured from the whole body photography. Then, during the reduction of the segment photography, the same points are assigned another set of coordinate locations. The transformations necessary to make the second set of points match their original positions on the whole body can then be applied to the coordinate description of the entire segment.

The control consisted of a series of crosses or x's marked with a non-oil base felt marker on the surface, which had first been cleared of frost and swabbed with alcohol. At least four points were marked on each body segment in locations visible from one or more stereocameras during whole body data recording. Additional requirements were that the points be widely spaced on the segment and not lie in a straight line.

In addition to the control points for relating segments to the whole body, at least ten control points were marked near the sides of the body. Common to both lateral and anterior-posterior whole body stereophotographic coverage, these points establish the spatial relationship between data from these two separate photographic situations.

Stereometric Recording of Whole Body Form

Two stereometric cameras, situated as shown in Figure 2, were used to take anterior and posterior (A-P) and left and right (lateral) view stereophotographs of the intact cadavers suspended in an upright pose by straps passing under the axillae.

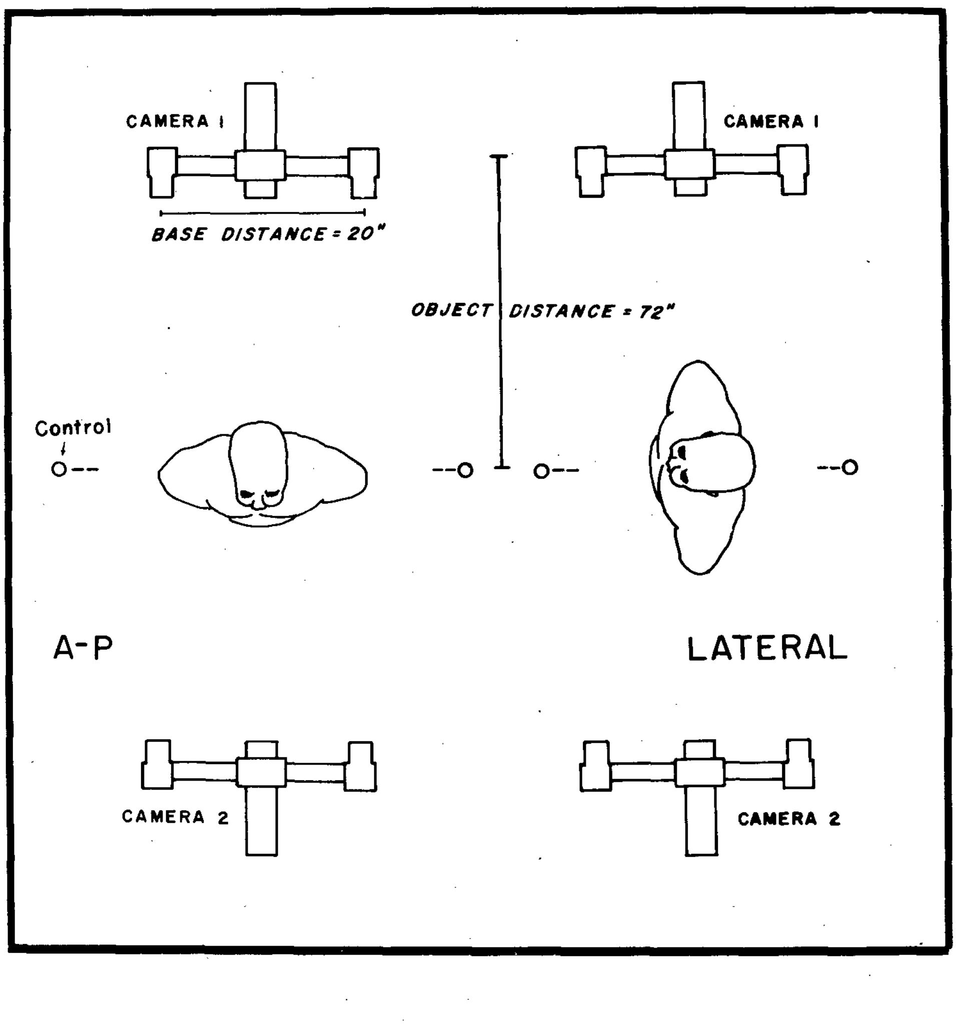


Figure 2 - A two camera array for whole body photography.

The control stands (Fig. 3) provide a "datum" or reference plane which is common to the imagery from each of the opposing stereometric cameras. This permits the analog transformation of coordinates from each view (i.e., from cameras 1 and 2) into a single coordinate system. Control points marked on the body surface in areas common (visible) to both A-P and lateral photography provide a means for joining the two sets of data points. On opposite sides of the cadaver, each stand supports a vertically suspended pair of steel tapes, graduated in English and metric units. Separated by a small space, the tapes on each side are parallel and coplanar. Perpendicular to the surfaces of the tapes on each side, steel rods of known lengths extend in both directions. High contrast markers affixed to the rods provide points for determining scale at four widely spaced locations in the image space.

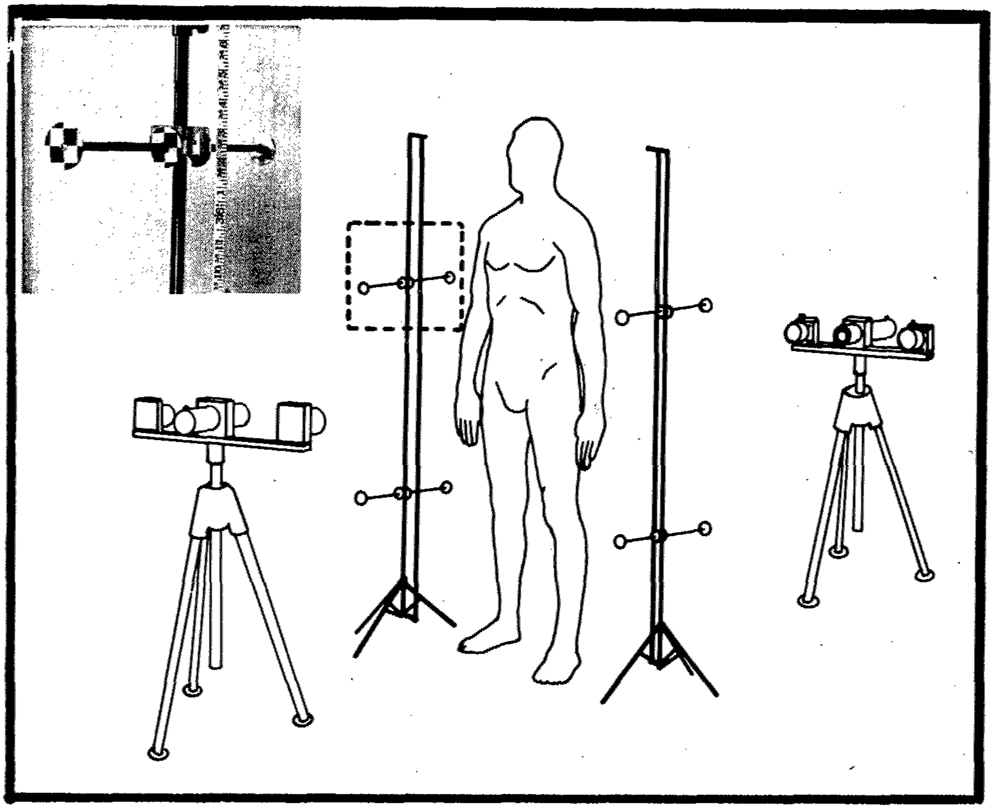
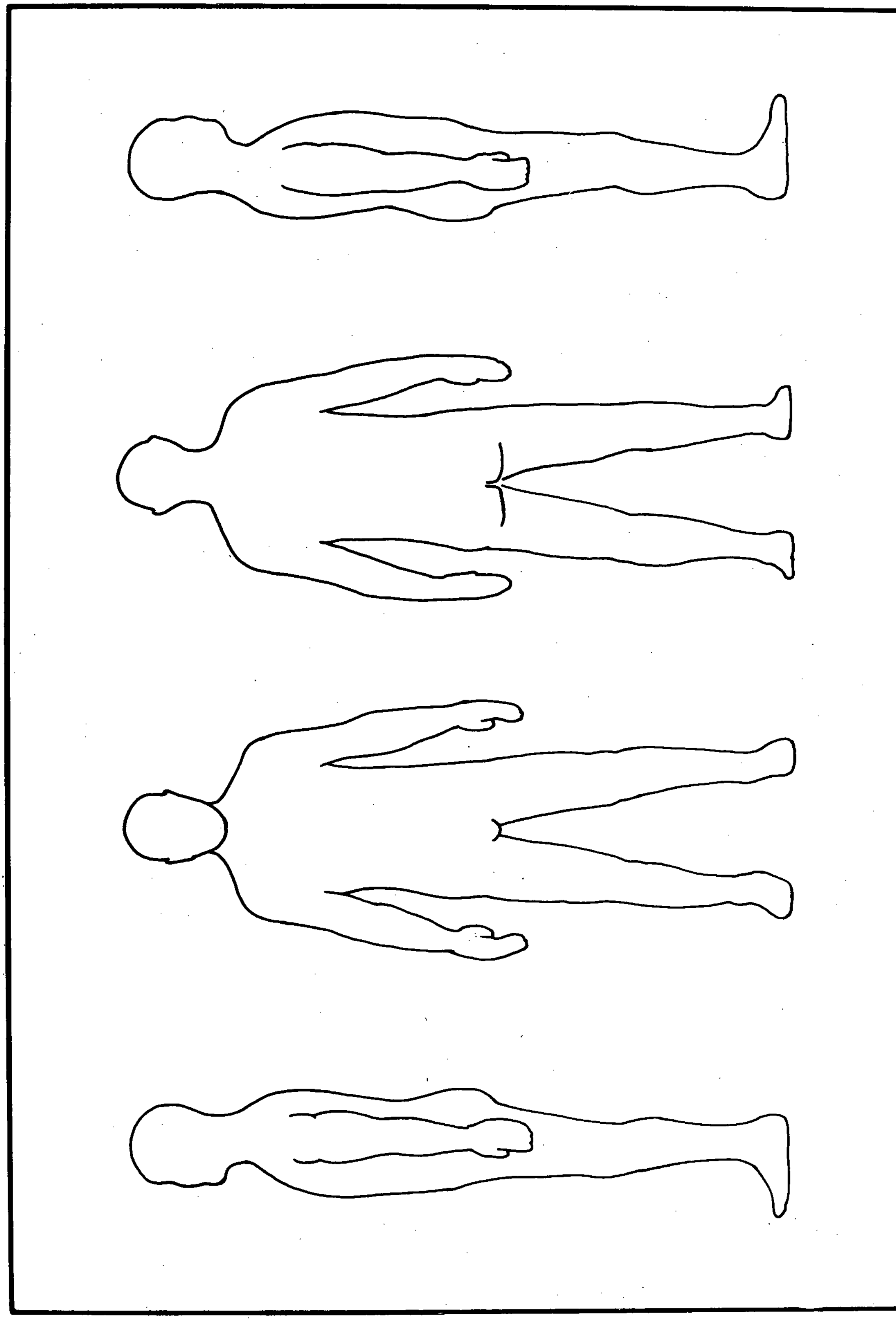


Figure 3 - Control stands are placed on either side of the subject. The insert shows details of the calibration devices.

After recording front and rear stereopairs, the cadaver was rotated through 90 degrees and left and right lateral stereoviews were recorded to provide complete all-around stereo coverage. Figures 4 and 5 illustrate the four views taken of each of the specimen cadavers.



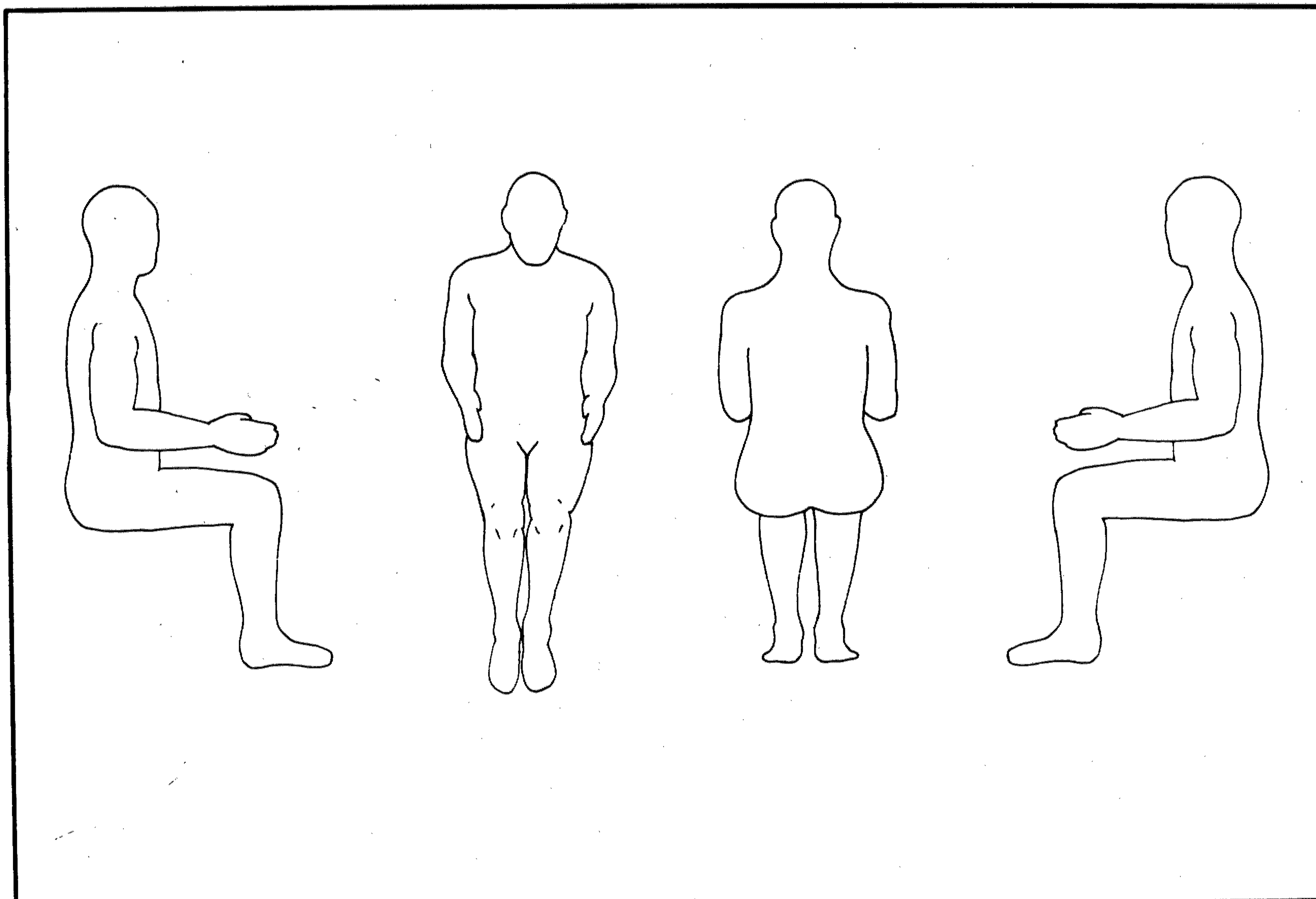


Figure 5 - Four views of seated cadaver.

Stereometric Recording of Body Segments

Although whole body imagery can provide sufficiently accurate data for all visible portions of the body surface, certain anatomical structures are often obscured by other body parts due to posture. Especially in the case of seated subjects, reducing the number of areas where points must be mathematically interpolated is an important consideration, since uncharacteristic irregularities in the surface of some of the cadaver specimens tend to make interpolation more difficult. Photographs of the body segments after cutting, taken from three stereometric cameras placed at equal intervals around the segments (Figs. 6 and 7) provide better coverage of the body surface.

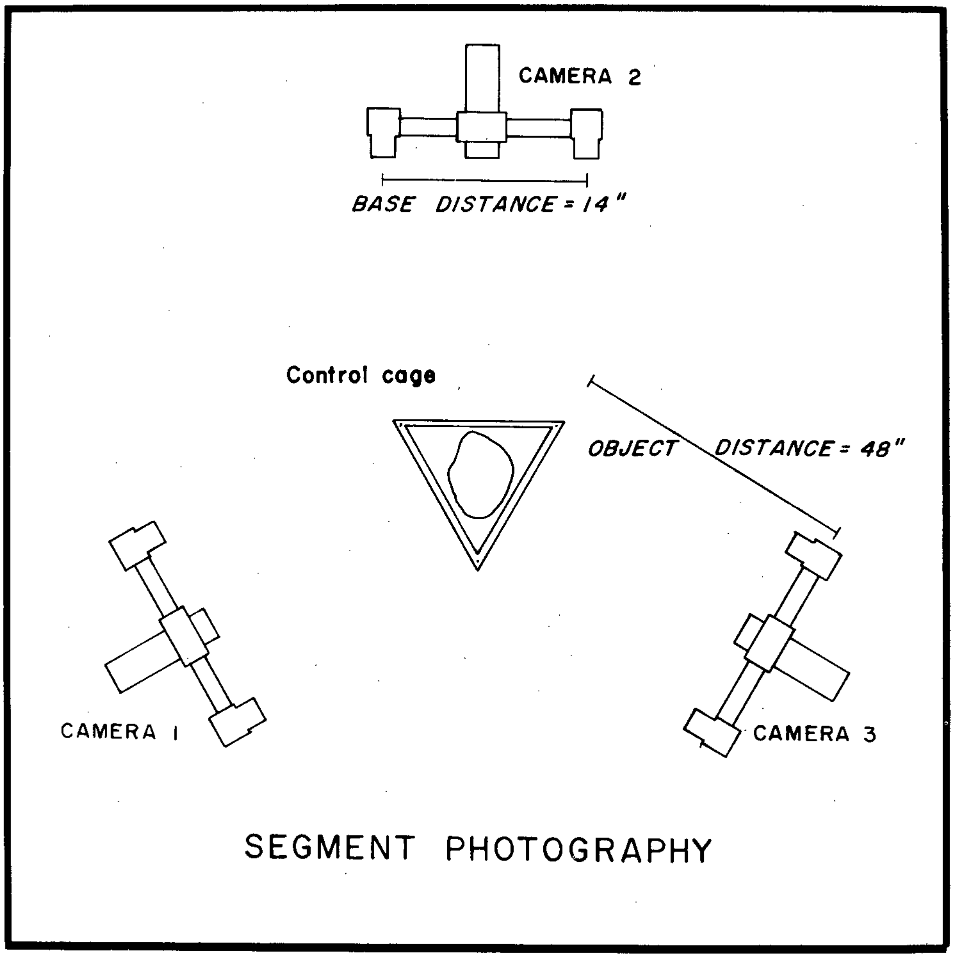


Figure 6 - Three camera array for segment photography.

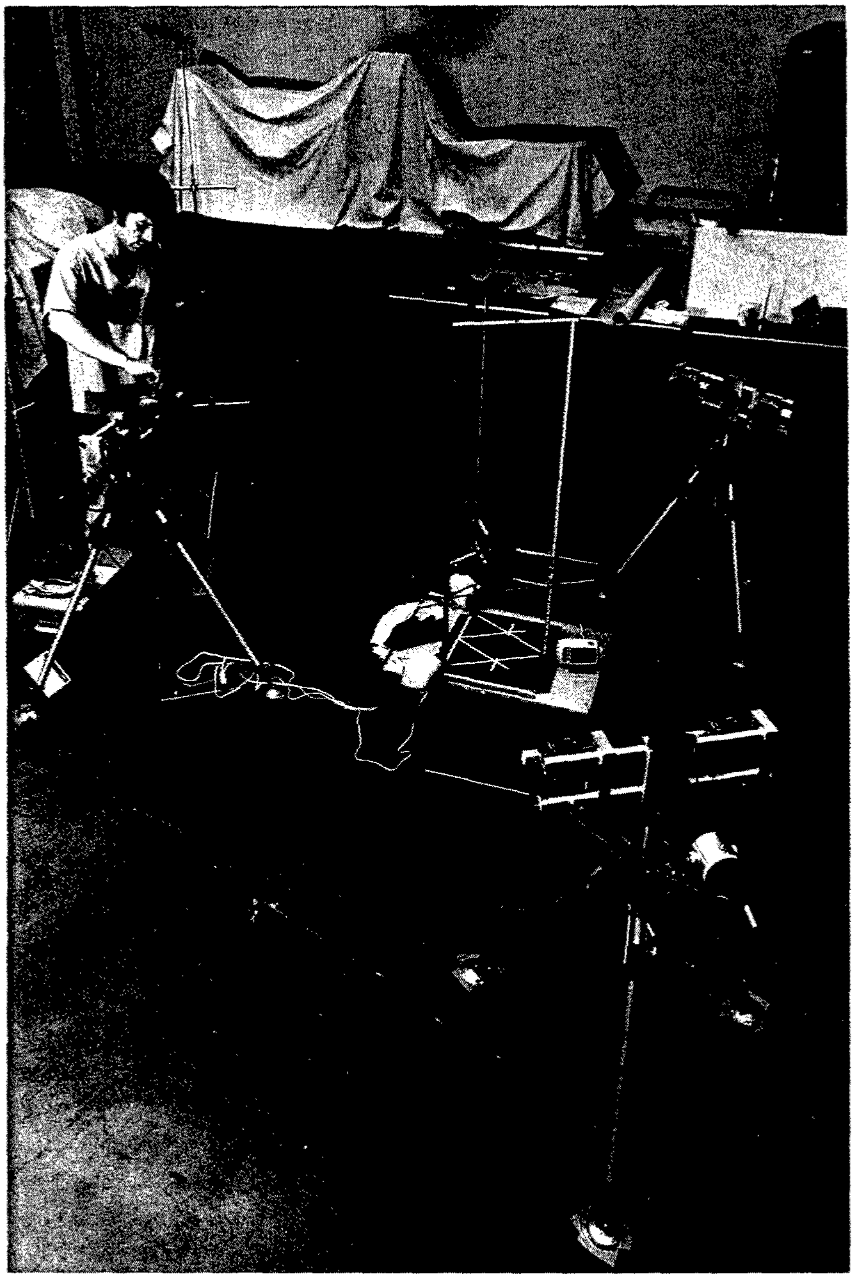


Figure 7 - Segment photography using three short base stereometric cameras.

The "control cage" (calibration device) for this stage of data collection was prism shaped, with each side placed parallel to the base of one of the stereometric cameras (Fig. 8). Graduated steel tapes run the length of the vertical supports for scaling and parallaxing. The function of the calibration elements is explained in more detail in the section on data reduction.

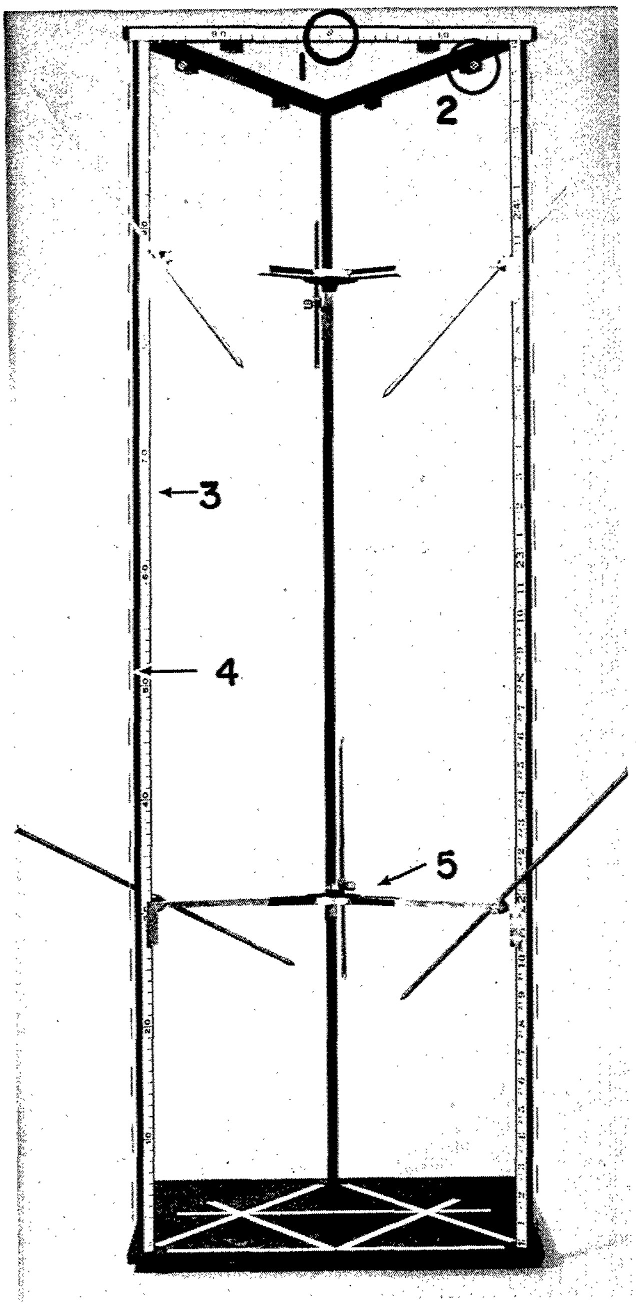
A restraining device covered with abrasive paper allowed several segments to be stacked together in the control cage. In this way, the number of stereopairs and data reduction time were kept to a minimum. Adjustable pins, where needed, supported the segments during photography (Fig. 8). The grouping of segments was the same for each cadaver (Fig. 9):

Group 1:	head, left foot, right foot;
Group 2:	left hand, left forearm, left upper arm;
Group 3:	right hand, right forearm, right upper arm;
Group 4:	right thigh, right calf;
Group 5:	left thigh, left calf;
Group 6:	trunk.

Prior to placing the frozen cadaver segments in the control cage, the accumulated frost was cleaned from the surface using towels and a brush. Some control points had to be remarked to ensure that they would appear clearly in the photographs. The segments were then carefully placed in the control cage, their longitudinal axes approximately vertical (Fig. 9). After photography, the segments were returned to the freezer.

Cameras

Reliable measurements begin with the correct design and placement of the elements of photographic data acquisition. The stereometric camera developed under contracts to NASA-Johnson Space Center and the US Army employs a pair of Hasselblad SWC cameras, modified to improve the metric quality of their imagery. The mounting assembly provides continuous adjustment of base distance (distance between lens centers) from 23 to 81.5 cm (Fig. 10). The tripod which supports the dual camera assembly and a "surface contrast optical projector" (SCOP) between the cameras has special "flat feet," rubber discs which maintain camera position. These discs are routinely taped to the floor to rigidly maintain the proper camera position.



1. Origin of coordinates.
2. Point for scaling in z.
3. Steel tape for scaling in xy.
4. Vertical lines for leveling.
5. Abrasive surface for stacking segments.

Figure 8 - Details of the control cage.

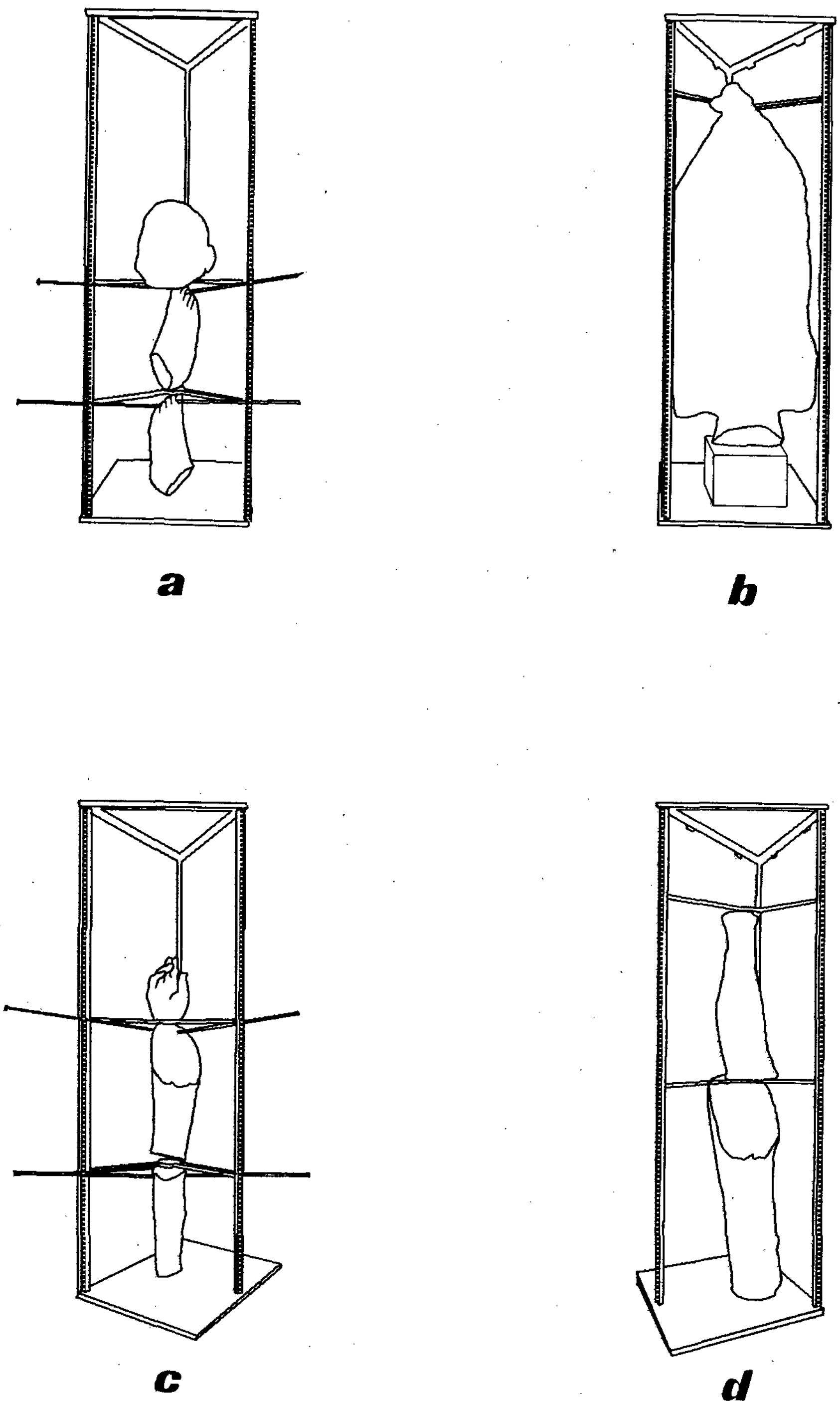


Figure 9 - Four of the six segment groups. (Groups c and d were the same for right and left limbs.)

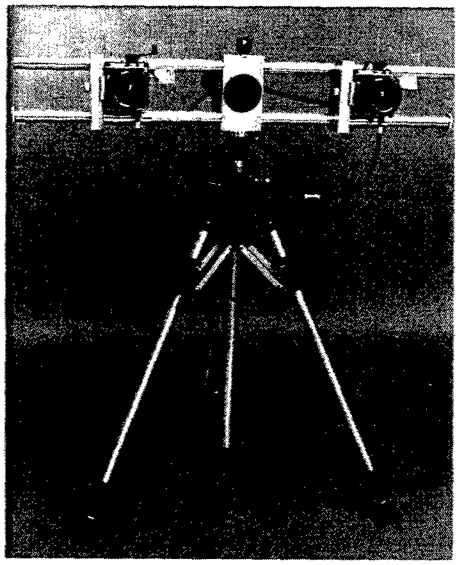


Figure 10 - Long base stereometric camera.

Any number of these stereometric cameras can be synchronized to fire simultaneously via electronic shutter releases connected to a common remote shutter release button [Fig. 11]. Also shown in Figure 11 is a plate holder in which unexposed glass plates are loaded into the camera.

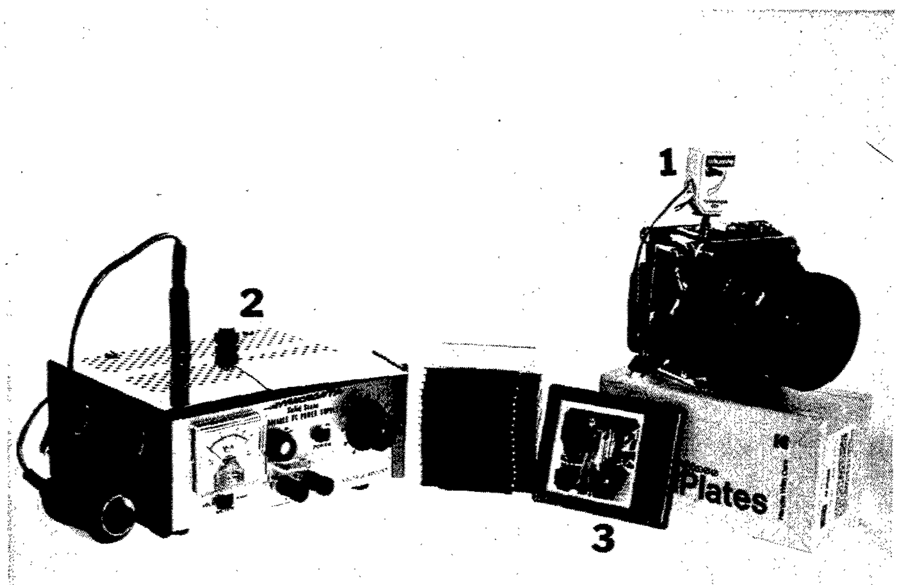


Figure 11 - Electronic shutter release [1], power supply [2], and a glass plate magazine [3].

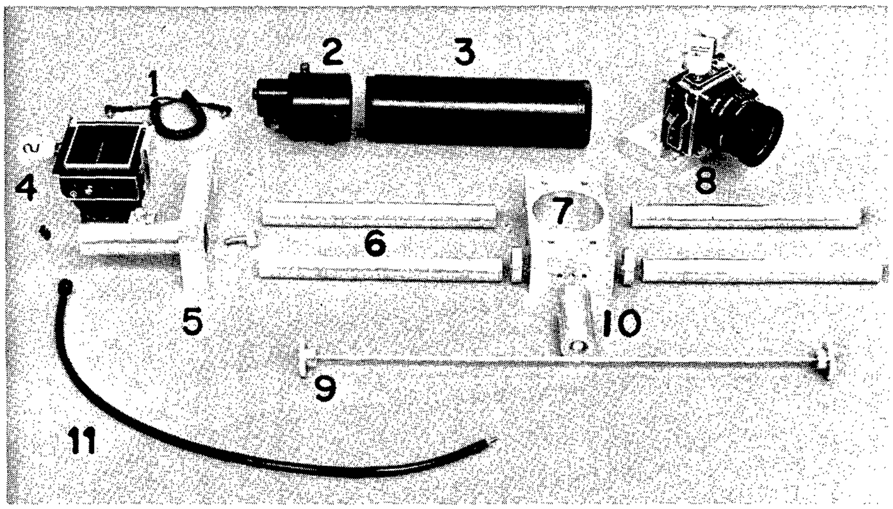


Figure 12 - Exploded View of a Stereocamera

Figure 12 is an exploded view of a stereocamera, less the tripod. The components are: 1 flash cord which connects strobe flash unit to one of the cameras; 2 strobe flash unit; 3 barrel with pattern slide and lenses for projecting and focusing pattern; 4 camera, not on base; 5 camera base; 6 alignment rails which hold the camera base; 7 basic support block and unit holder; 8 camera attached to its base; 9 camera base stop rod; 10 connector to tripod and 11 fiber optic cord.

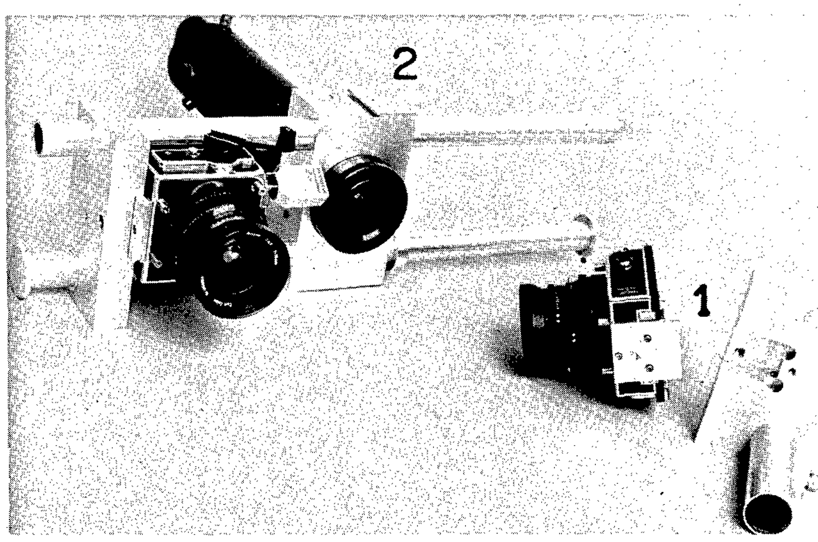


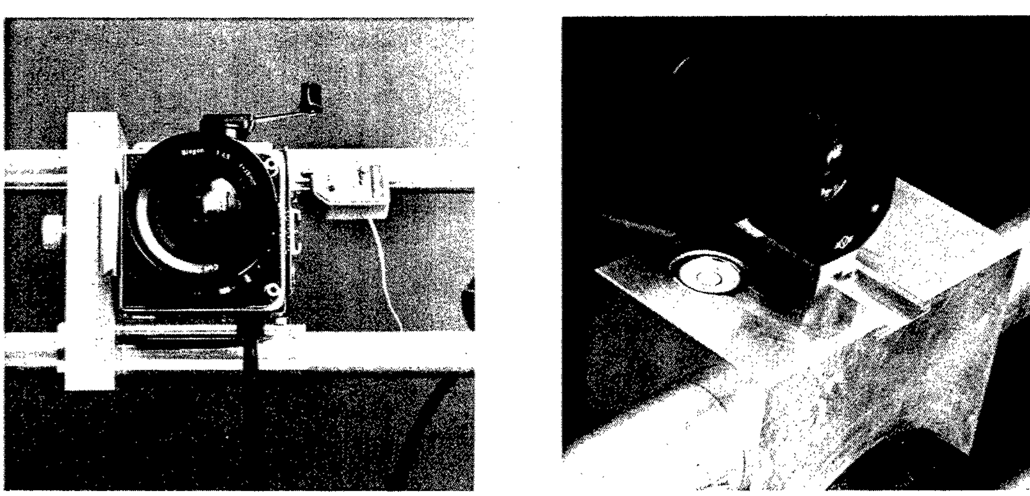
Figure 13 - Partially assembled Stereometric Camera

Figure 13 shows a partially assembled stereometric camera. The camera and bases [1] are fitted together in a dovetailed channel which eliminates rotation of the camera on the base. The rails are precisely machined to their holding block [2] so that they are collinear and parallel.

Together, these two features fix the relative orientation of the camera film planes. At the end of each rail there is a retaining knob to ensure that the camera does not accidentally slip off the rails while the equipment is being set up or adjusted.

The individual cameras are mounted on a double rail (Fig. 14a). Protruding from under the camera is a (black) fiber optic tube which is connected to the strobe light of a centrally-mounted "surface contrast projector." Thus, firing of the strobe projects a random high contrast "texture" onto the body surface and, simultaneously, illuminates a set of "fiducial" marks on each image. These marks--one at each corner of the image--are used to reconstruct the camera geometry for stereoplotting purposes.

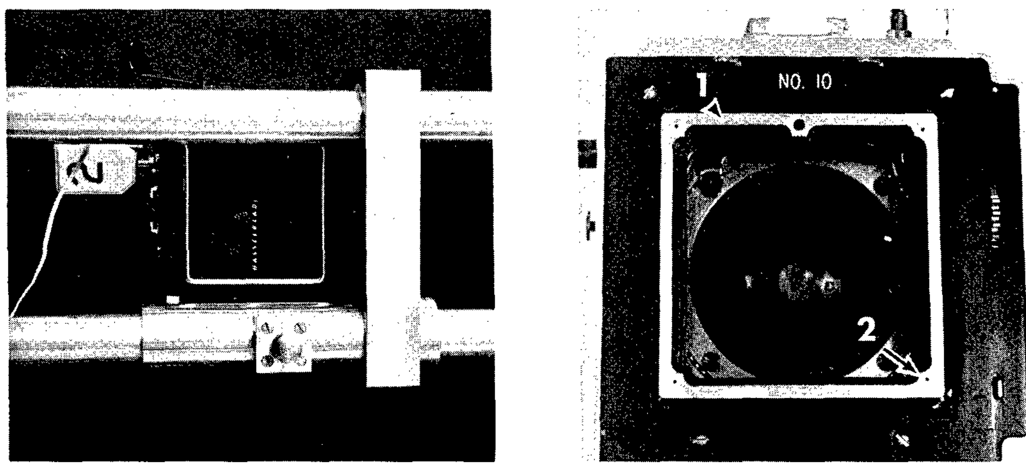
Figure 14b shows two calibration devices, a bubble level and a sighting scope. The bubble level is used to place the film plane perpendicular to the horizontal and the sighting scope is used to align the two sets of cameras so that the camera bases are parallel. This procedure ensures that the relationship between the film planes, the control stands, and the floor closely approximates an orthogonal system, which reduces the time needed to "set up" the imagery in the stereoplotter. The two calibration devices are mounted on the block which holds the surface contrast projector.



a **b**

Figure 14 - The double rail assembly and calibration devices help simplify the reconstruction of camera geometry.

Figure 15 shows two details of the camera backs. Figure 15a has the camera mounted on the base with the back closed. In Figure 15b the back is open and 1 is a super flat surface against which a selected flat glass photographic plate is pressed. One of the fiber optic fiducials is labelled 2.



a ***b***

Figure 15 - Two views of the camera back.

Kodak "M" plates were used for all photographs. A panchromatic emulsion coated on 2½" x 2½" x 0.05" selected flat glass, the plates were rated at an effective exposure index*of 250 for exposure by the electronic flash projector (SCOP). The shutter speed was adjusted according to ambient light intensity to 1½ or 2 times the indicated exposure time in order to emphasize the projected pattern. All plates were processed normally, in DK-50 at 68 F for 7½ to 8 minutes. After drying, sorting and inspecting the plates, the photographer repeated the photography of those segments for which the initial imagery was considered below the desired quality.

*Similar to, but not identical with ASA ratings of photographic emulsion speed, which are derived using highly standardized sensitometric methods of exposure and processing, the effective exposure index refers to a speed rating assigned for special conditions of exposure and processing.

In all, the stereometric record of each cadaver comprised 44 plates, or 22 stereopairs.

For measurement on the Kern PG-2 stereoplotter, all plates were enlarged 3.86x onto Kodak Aerographic Duplicating Film, Estar thick base (Fig. 16). The enlarger (Fig. 17), designed and constructed by the Biostereometrics Laboratory, has a (precision machined) vacuum easel which maintains flatness of the stable base film. Parallelism of the film and image planes has been set with an auto-collimator. The lens, a 135 mm focal length Fujinon-E, produces -0.02 per cent distortion at its basic magnification of 5x and has a range of magnification from 1.5x to 10x. In the initial calibration check of the enlarging system using a precise grid, the distortion due to enlarging the plates was below the tolerance of the measuring instrument.

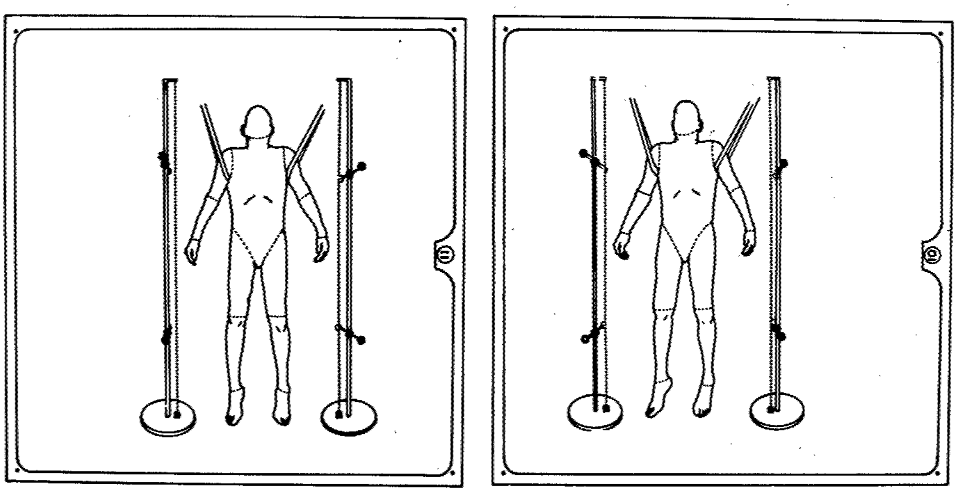


Figure 16 - Line drawing of typical stereometric images enlarged from glass plates.

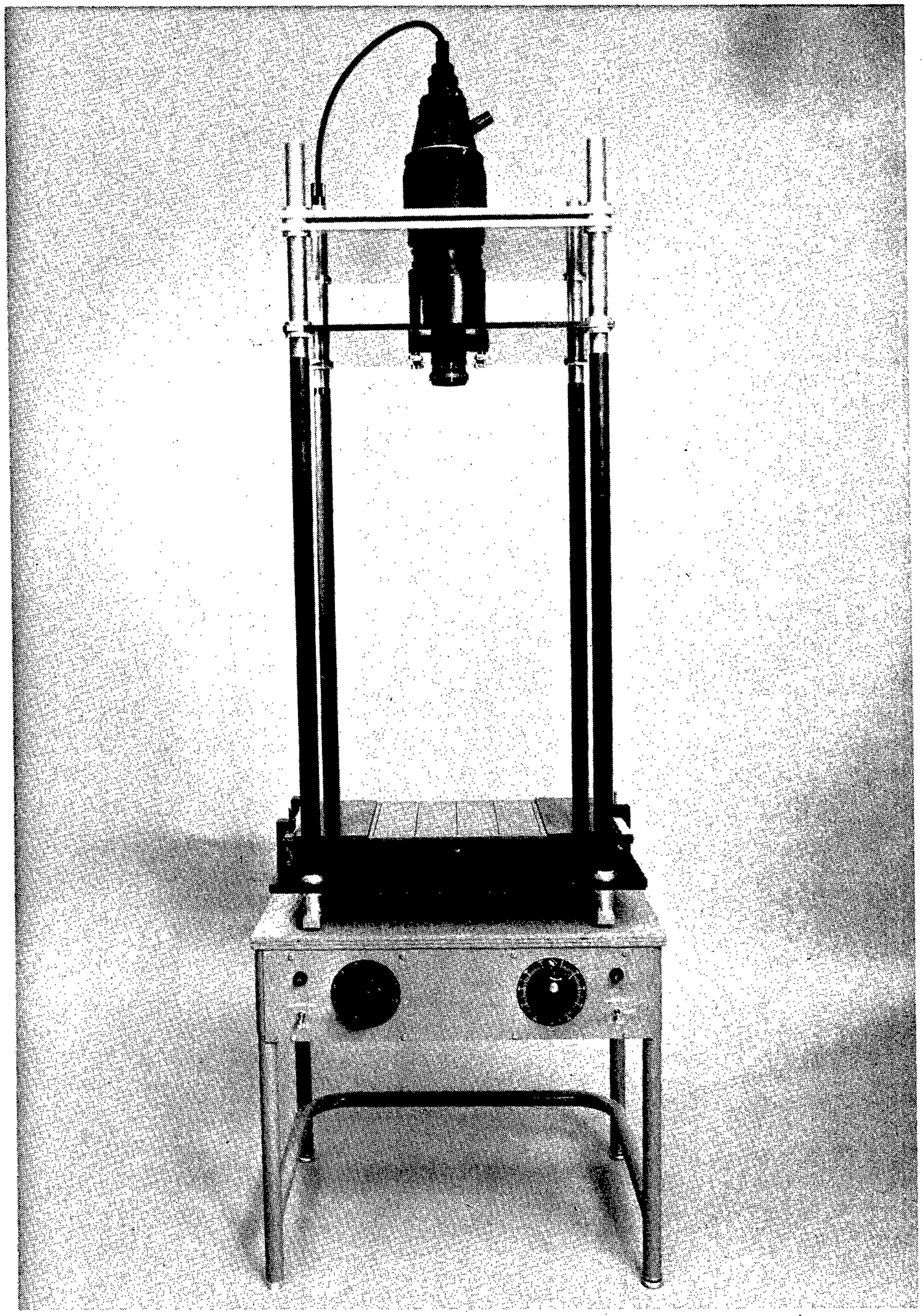


Figure 17 - The enlarger used to make film diapositives.

Stereometric Data Reduction

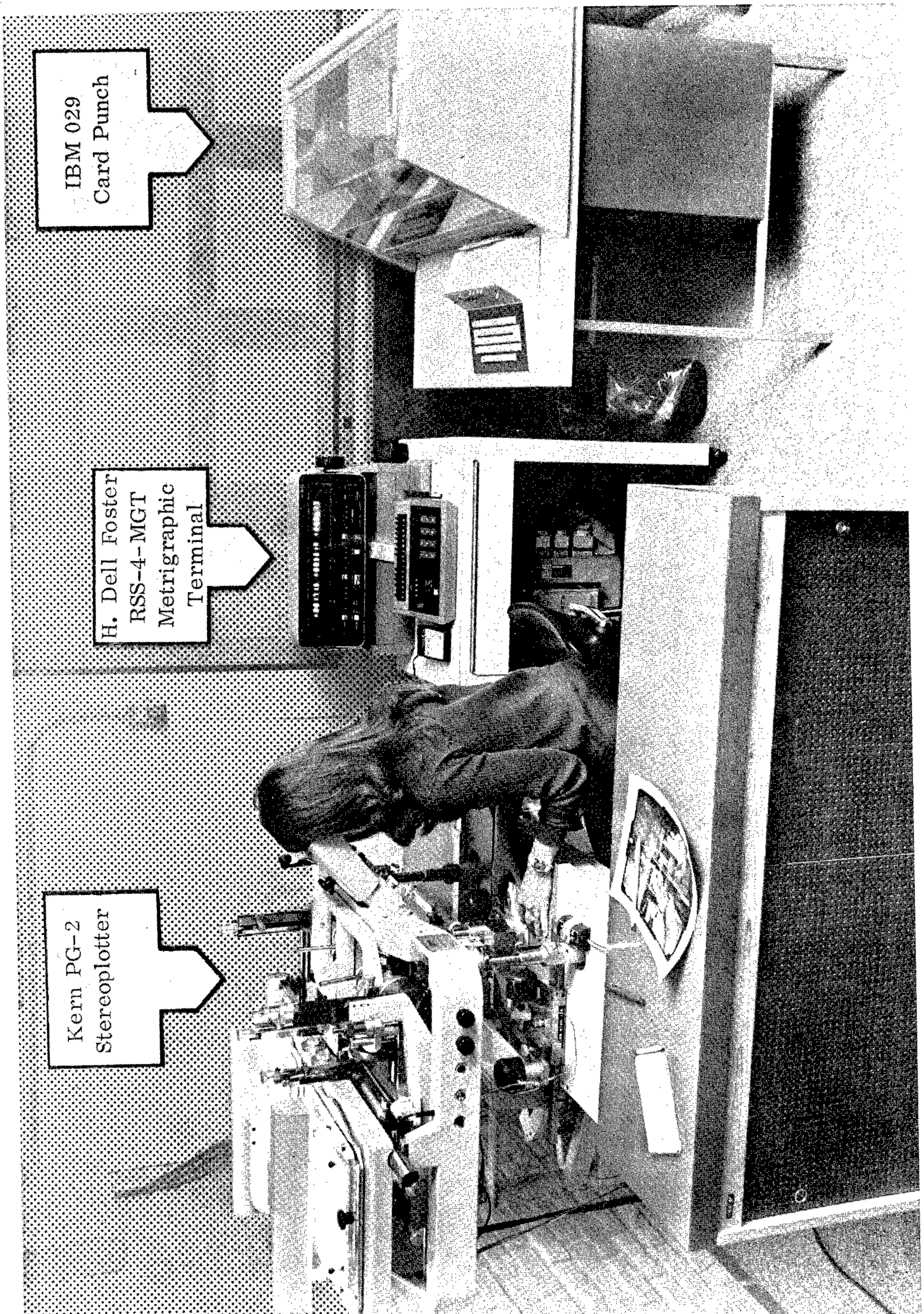
The three-dimensional images were restituted and measured on a Kern PG-2 stereoplotter. The xyz coordinates were recorded in punch card form using an H. Dell Foster RSS-4-MGT Metri—Graphic Terminal interfaced to an IBM 029 card punch. The punch card data served as input to an IBM 360/50 computer which was programmed to produce the desired output. The various components of the stereoplotting and point recording system are shown in Figure 18.

In very simplified terms, the reduction of the stereometric images to point coordinate data is analogous to measuring a three-dimensional image formed by reversing the direction of light rays which originally exposed the photographs (i.e., projecting the left and right images to form a stereomodel). Viewing this three-dimensional model through the optics of the stereoplotter, a technician manipulates the image of a lighted dot within the same space to indicate points on the surface of the stereomodel. By recording the movements of this dot (the "floating mark") in three directions, the xyz coordinates of selected points on the surface are established. A continuous digital readout of all three coordinates appears on the RSS-4-MGT quantizer which, on command from the technician, transfers the data points to the card punch for storage. The xyz coordinates then refer to movements of the floating mark relative to an arbitrarily defined point on the surface of the tapes on the control stands.

At this point in the data reduction, the coordinates refer to a three-dimensional axis system defined within the instrument independent of the orientation of the body part or segment being measured. The instrument coordinates of each view differ slightly from those of the other views and must be transformed to a single system before the orientation of coordinate axes can be related to anthropometric features of the body.

Reconstruction of Camera Geometry

The restitution in the Laboratory of the spatial relationships between the images, cameras and the coordinate system produces a replica of the photographic stage in which the images are enlarged, the plotter optics replace the cameras and the stereomodel is a three-dimensional scaled version of the scene photographed. This is done in three steps.


IBM 029
Card Punch
H. Dell Foster
RSS-4-MGT
Metrigraphic
Terminal
Kern PG-2
Stereoplotter

1. Inner orientation - ***This is the positioning of the photographic images relative to the perspective centers of the instrument so as to reproduce the relationship which obtained during the photographic exposure between the inner pupil of the lens and the fiducial marks recorded on the film.*** With the aid of the fiducial marks recorded at the corners of each image, the individual plates of a stereopair were centered on plate holders designed to maintain film flatness. The plate holders were then placed on the plotter and the plotter principal distance set at a predetermined value, 151.67 mm., which corresponds to the original lens-film distance multiplied by the enlargement factor of the plates.

2. Relative Orientation - ***The object of this step is to restitute the relative position between two cameras of a stereopair (i.e., angles and displacements) using the y component of the discrepancies in image location (parallax). Execution of this step completes the restitution of an analog three-dimensional image of the photographed scene (i.e., the object to be measured).*** Parallax is eliminated on five points of the projected image with a sixth point as a check (Fig. 19).

3. Absolute Orientation - ***In this step the position of the two cameras as a unit is restituted along with the stereomodel of the object with respect to the chosen coordinate system (Figs. 19 and 20). This is done by performing an analog three-dimensional transformation with six parameters, leaving a seventh, scale, to be applied later.*** Using the graduated steel tapes (in the intact cadaver photographs or the threads parallel to the vertical supports of the control cage in the segment photographs), the three-dimensional imagery was rotated in omega (Ω) around the x axis, in phi (ϕ) around y, and in kappa (κ) around z to bring a chosen image plane into parallel with the xy plane of the plotter and align a chosen image line parallel to the y plotter axis. The translation was accomplished by placing the origin of coordinates of the plotter axis system at a chosen image point.

The references used for the different types of imagery were as follows:

(a) Whole body stereo models (A-P): Rotation (leveling) in Ω was made using two points (upper and lower) 152.40 cm apart on the tape at subject's left, and in ϕ using the center of tapes at the left and right of the subject. Rotation (alignment) in κ was made along the tape at subject's left (Fig. 19).

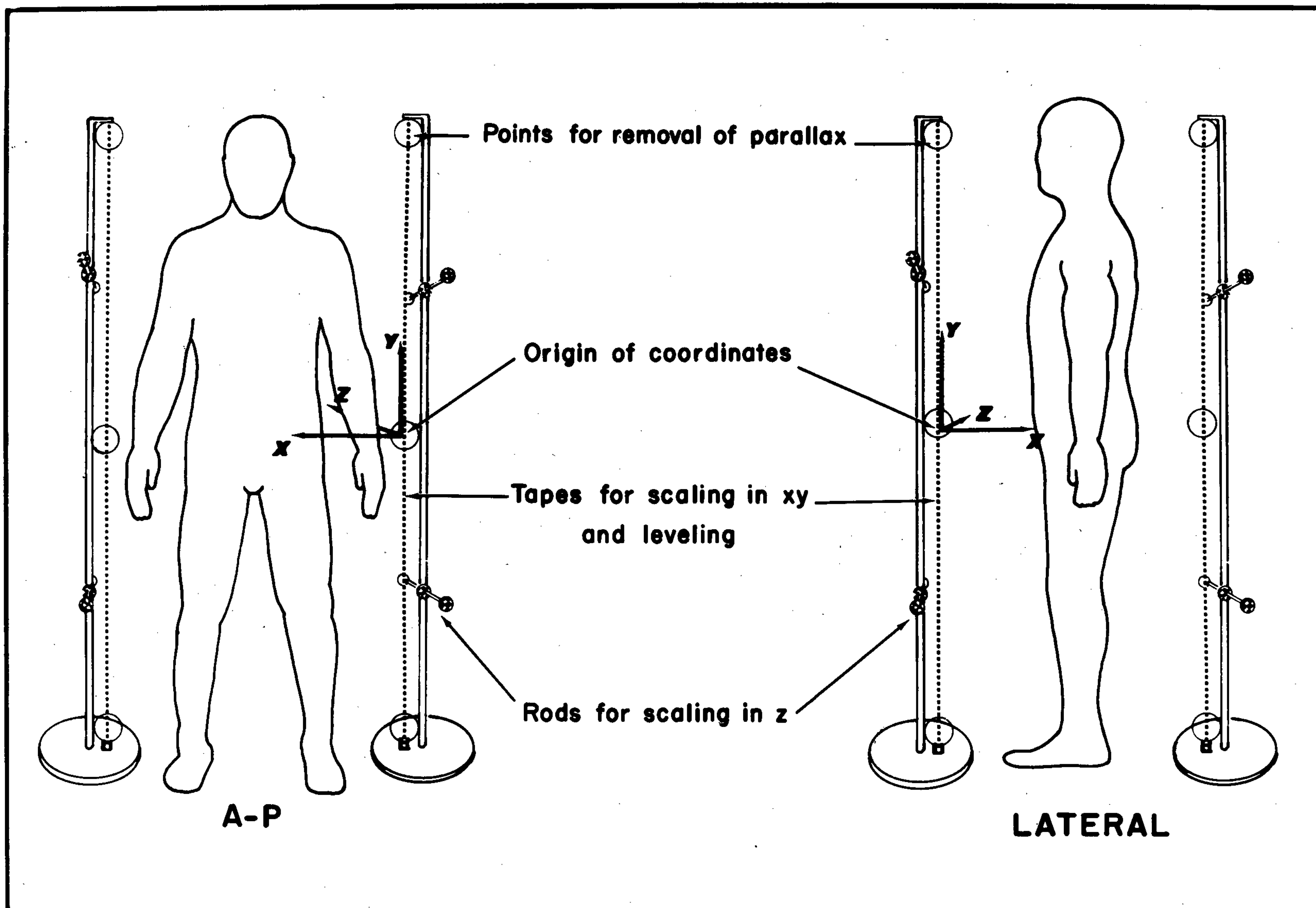


Figure 19 - Control and calibration elements for whole body photography, A-P and lateral. The axis system refers to instrument coordinates.

(b) Whole body stereo models (lateral): Rotation (leveling) in Ω was made using two points (upper and lower) 152.40 cm apart on the tape at subject's front and in ϕ using center of tapes at front and back. Rotation (alignment) in κ was made along the tape at subject's front (Fig. 19).

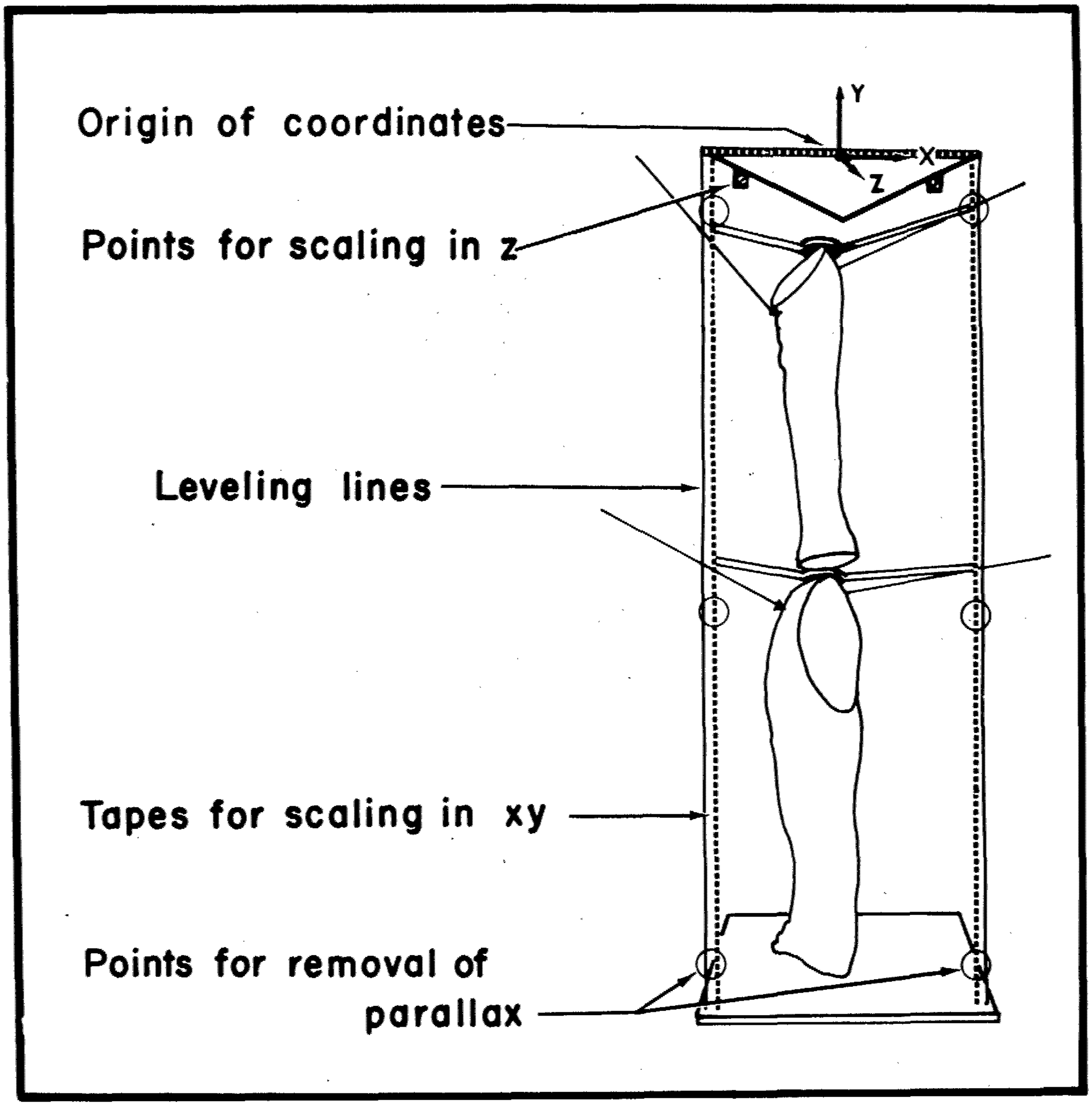


Figure 20 - Control and calibration elements for segment photography.

(c) Segment stereo models: Rotation (leveling) in Ω and Φ was made using a system of three points--two of them approximately 90 cm apart on the vertical string at operator's left and the third at the midpoint of the string on the operator's right. Rotation (alignment) in κ was made along the string at the operator's left (Fig. 20).

(d) The origin of coordinates for the stereomodel (X_o, Y_o, Z_o) was taken at a pre-marked point on the front or left tape (Figs. 19 and 20).

Stereoplotting Procedures

Whole Body

The control stands provide a reference plane and a point which permits transformation of the coordinates from each view into a single coordinate system. Scale factors are needed to transform the data points read from the stereo model to the actual object coordinates. Using the graduated steel tapes of the control stands and the rods perpendicular to them, the xyz coordinates of known object distances in the model are read. Processing of these coordinates using the appropriate computer programs yields the necessary scale factors for the above transformation.

Each of the four stereopairs of the intact cadaver (A-P and lateral) contains control points marked on the body surface. The coordinates of these control points were read and recorded on punch cards. Control points visible in more than one of the stereo models provided the means for transforming the coordinates into a single coordinate system. After application of scales as the seventh parameter, the front and back models are in the same coordinate system, which differs from the one used in the left and right models. This calls for a 3-D transformation with only six parameters, solved by the points common to (A-P) and (R-L) views.

Segments

Scale factors are also needed to convert the segment instrument data points to segment coordinates. For this purpose, coordinates of two known distances were read on the graduated tapes of the control cage. Depth control distances were also read at predetermined points on the control cage. The models were measured in three different coordinate systems and the geometry of the control cage was used to compute the parameters needed to transform all three systems to one.

Measurements

We have found that the most systematic way of acquiring the necessary coordinate points for our computations is to read the points along parallel cross sections approximately perpendicular to the main axis of the segment (y instrument axis, [fig. 19]). A specially-designed attachment has been added to the Kern PG-2 which prevents y axis movement of the base carriage at any point along the main axis of the segment. The y coordinate is fixed at the uppermost visible level of the segment which corresponds to an even mark on the steel tapes of the control cage. The model is then scanned (from left to right) and a series of xz coordinate points are read with a common y coordinate. The y coordinate is then repositioned along the tape until the next interval is found; another series of coordinates is then read, and so on, until the entire main axis has been covered (Fig. 21). In the present case, the interval between cross sections was 2.54 cm, except for the head, hands, feet and abdomen segments where the interval was 1.27 cm. The distance between two consecutive points along the perimeter of the cross section, ranges from 0.1 to 1.2 cm with an average of approximately 0.7 cm at object scale. A series of xyz coordinates were also read around the perimeter of the cut lines. After all views of all segments were read, the data (in punched card form) were arranged for processing in the computer.

These data, i.e., cross sectional points and control points marked on the segment, and cut line points together with the control point data from the whole body, constituted the input for a series of computations to produce the final parametric output (Fig. 22). The computations are explained below (in the section entitled "Computation of Body Mass Distribution Parameters").

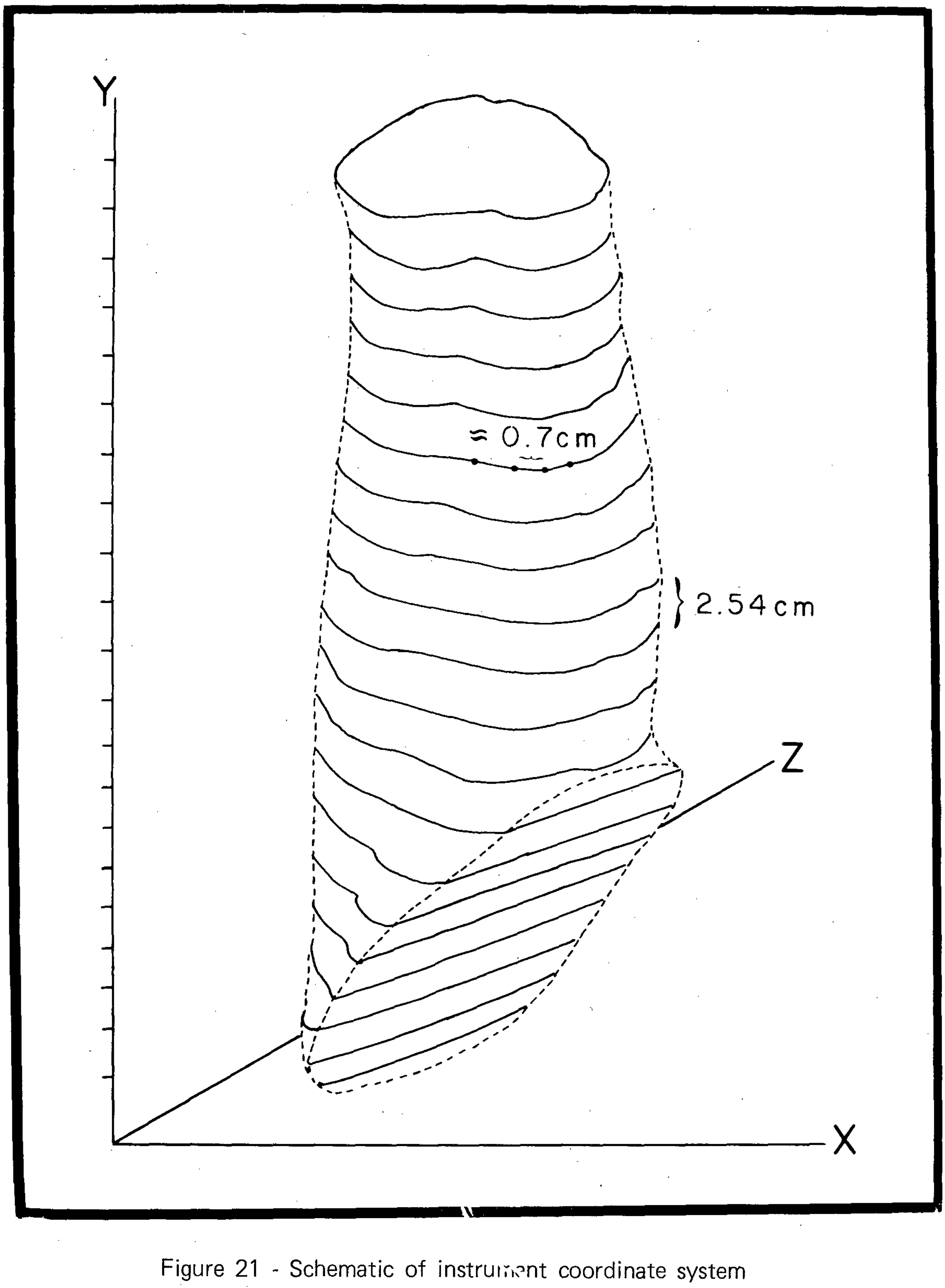


Figure 21 - Schematic of instrument coordinate system showing plane of cross sections.

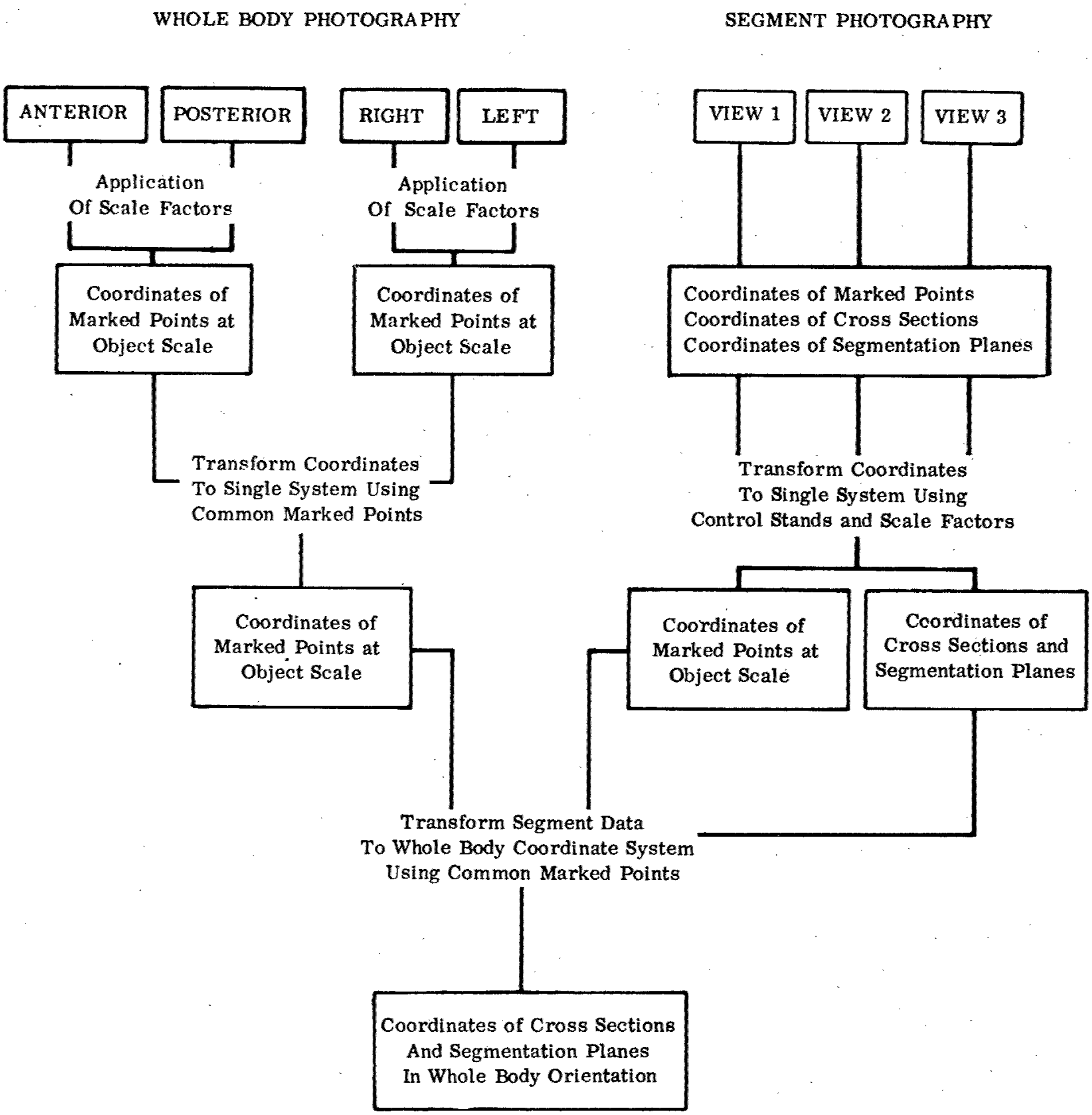


Figure 22 - Diagrammatic representation of stereometric data reduction of cadaver segments.

Computation of Body Mass Distribution Parameters

All body mass parameters are computed from the digital stereometric data for the various body parts. The method of obtaining these data (xyz coordinates) has already been described. In this section we will present the mathematical basis for computing the body mass parameters, as outlined schematically in Fig. 23 (p. 40).

The coordinate data points are distributed along cross sections perpendicular to an axis which approximates the main axis of the segment. This alignment permits: (i) simple interpolation between data points; (ii) definition of an elemental area by means of straight line segments; and (iii) subsequent definition of segmental volumes by second order interpolation curves. The elemental area is a triangle defined by two consecutive points on the cross section and a third point which is the average coordinates of all the points of that cross section. This third point is not an approximation of the center of gravity but a convenient one for the computations only. For this elemental area, we compute the coordinates of its center of gravity and its surface area [1]*. We then compute the cross sectional center of gravity and cross sectional area [2]. From the cross sectional data points shifted to the computed center of gravity we define new elemental triangles and, in turn, compute for them: Ixx, Iyy, Izz and Ixy [3], with origin at the cross sectional center of gravity. By simple summation we obtain the following elements for the cross section: Ixx, Iyy, Izz and product Ixy, with the origin of coordinates at the center of gravity of the cross section [4]. With these elements computed for all the cross sections of a segment we can apply a parabolic interpolation [5] along the longitudinal axis of the segment to all five elements of the cross section and obtain a new set of parameters as if we had measured the segment using a very small cross sectional interval. Thus, we can say that the segment is composed of elemental slices with mass parameters which can be computed from the area, center of gravity, inertial values of the top and bottom surfaces, and the thickness of the elemental slice [6]. Using well-known formulae, we can compute volume and center of gravity for the segment [7] and moments and products of inertia with origin of coordinates at the segmental center of gravity for each slice [8] which now can be used in the proper summation procedure to obtain all inertial parameters for the segment [9].

In the course of the stereoplotting operations (described earlier) we obtained coordinates of pre-marked points on the whole body and coordinates of the same points on the segments. We can then perform a 3-dimensional transformation [10] of the segment point coordinates to the whole body point coordinates, by obtaining the proper parameters (after Schut) using a least squares fitting technique (since we have marked and measured more points than are needed to solve the six parameters of transformation).

*The numbers in square brackets refer to the computational steps which follow in Appendix I.

Using the transformation parameters (direction cosines and translations), we can transform the moments and products of inertia of the segment [11] as well as the center of gravity [10] to the whole body coordinate system and, thus, generate the total body parameters [7, 8 and 9].

To obtain the principal axes' inertial elements from the segment or body axis elements, we use an iterative rotation procedure (after Jacobi) for transforming a real symmetric matrix into a diagonal form. Once the final parameters of transformation are obtained (direction cosines), we can perform the tensor transformation [11] for the segments and the whole body in order to obtain the respective principal moments of inertia.

Since we have used volume as mass, it is only necessary to apply the density as a multiplying factor to the inertial tensor data and the computation is complete. With the stereometric mathematical model, different densities can be introduced during the computation for different body parts, segments, cross sections or sectors of a cross section (elemental triangle). The density data available at the moment are limited to body segments (see Table 1). Density 1 values were used as a simplification. The Density 2 values were based on Chandler *et al.* (1975), and the Density 3 values appear in Clauser *et al.* (1969). The density values were provided by the contractor and are used as average densities of each segment, which are considered for the purpose to be of uniform density. In the near future available data will include discriminate densities along the axis of cross sectioning and, eventually, discriminate densities for each elemental area (elemental triangle).

The use of the elemental triangle is based on the fact that we can assume that an area bounded by a soft, closed curve that is monotonic in radius versus angle as measured from a given central point and a given zero direction can be approximated by a polygon of sufficient sides so as to obtain a certain accuracy in the computation of its various parameters, i.e., area, perimeter, etc.

For the human body we chose to define small sides of the polygon by measuring along the perimeter of cross sections in the transverse plane, points as close together as 0.1 cm. in areas of sharp curvature or as distant as 1.2 cm. in relatively flat areas.

A simple example will convey a better idea of the concept. If, from the center of a forearm cross section, we define an angle of 0.1 radians, we also define at the perimeter a polygonal side 0.7 cm. in length. We can for this elemental triangle compute the area and moment of inertia. Comparing the results with the values obtained from the same sector (rather than a triangle), there is a change of only 0.5%. Of course, the change in center of gravity will not be even that large because opposite segments of the human body tend to be analogous.

The use of elemental triangles lends itself to the definition of different densities within a cross section. For example, in the abdomen, the posterior elements will have a greater density than their anterior counterparts because of the presence of bony structures. Careful analysis of the distribution of tissue densities can be carried out in a carefully sectioned specimen and expressed as a polynomial equation in polar form where the variable radius is replaced by density. A precedent for use of this form of equation for similar purposes appears in previous work of the Biostereometrics Laboratory (Herron *et al.*, 1974). ***There will be as many density equations as sections were taken in the specimen; the density equation of any cross section can then be interpolated.***

The interpolation of values is based on the characteristics of a gradually changing surface. Human body segments have a continuous, smoothly changing volume function which has been successfully interpolated in volume measurement techniques developed in the Biostereometrics Laboratory. The same characteristic applies to inertial values when computing cross sectional moments and products. The parabolic overlapping interpolation was chosen because it minimizes the tendency of power polynomials to create artificial peaks and valleys between the raw data values.

Results

The complete results of the study are presented in Tables 1 to 122, given in the appendix to avoid breaking up the narrative. The following information relates to the contents of the various tables and to the rationale for the chosen form of presentation.

References to cadaver parts and segments by number follow the system illustrated in Fig. 24. The separation between segments 2 and 3 has no relation to anatomical features. Its location is given in tables 2 to 7. Segment 16 is the aggregate of segments 2 and 3.

For the final data presentations, we used a system of coordinates with the origin at the whole body center of gravity (Fig. 25). (The origin, then, varies with each subject, and each set of density values.) The x axis increases from the cadaver's left to right, the y axis from back to front and the z axis towards the head. The seventh parameter of the axes was chosen so that each unit represents one centimeter. This particular orientation was chosen because it is related conveniently to the vertical or z axis.

The shifts in the center of gravity of the parts and the whole body due to the use of different relative densities for the segments are defined in terms of the coordinate system having its origin at the whole body center of gravity when the density is taken as uniform and equal to one.

The locations of centroids were computed as the respective arithmetic means of the points measured along the cut lines. As each cut produced two surfaces, we computed two sets of values for each centroid and the average of the two was taken as the final value. The standard deviation of the average was in the order of ± 0.3, ± 0.2, and ± 0.2 cms for x, y and z, respectively.

Segment length was computed as the distance between the proximal and distal centroids of each segment with the exception of the foot segment length which was taken as the distance from the plane of the first heel cross section to the distal end of the toes.

The center of gravity of each segment was defined in two ways: (i) as a coordinate location and (ii) as a distance from the proximal centroid. (Tables 2 - 7) Note that the whole body center of gravity also could be located vertically by measuring down from the horizontal cut at the neck level, the value indicated as PROX.-C.G. for segment 16 in Tables 2 to 7.

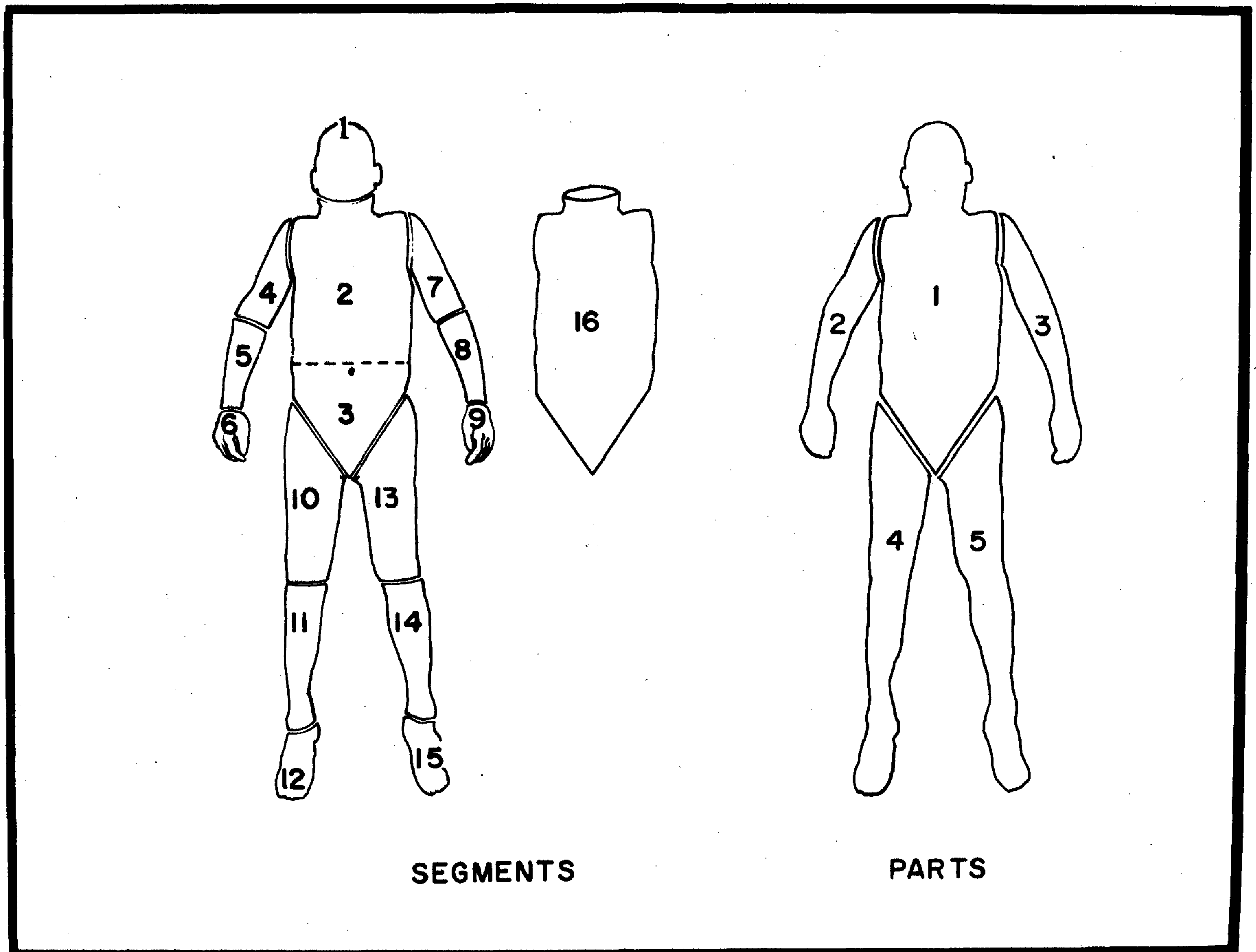


Figure 24 - Segment numbers and body part numbers.

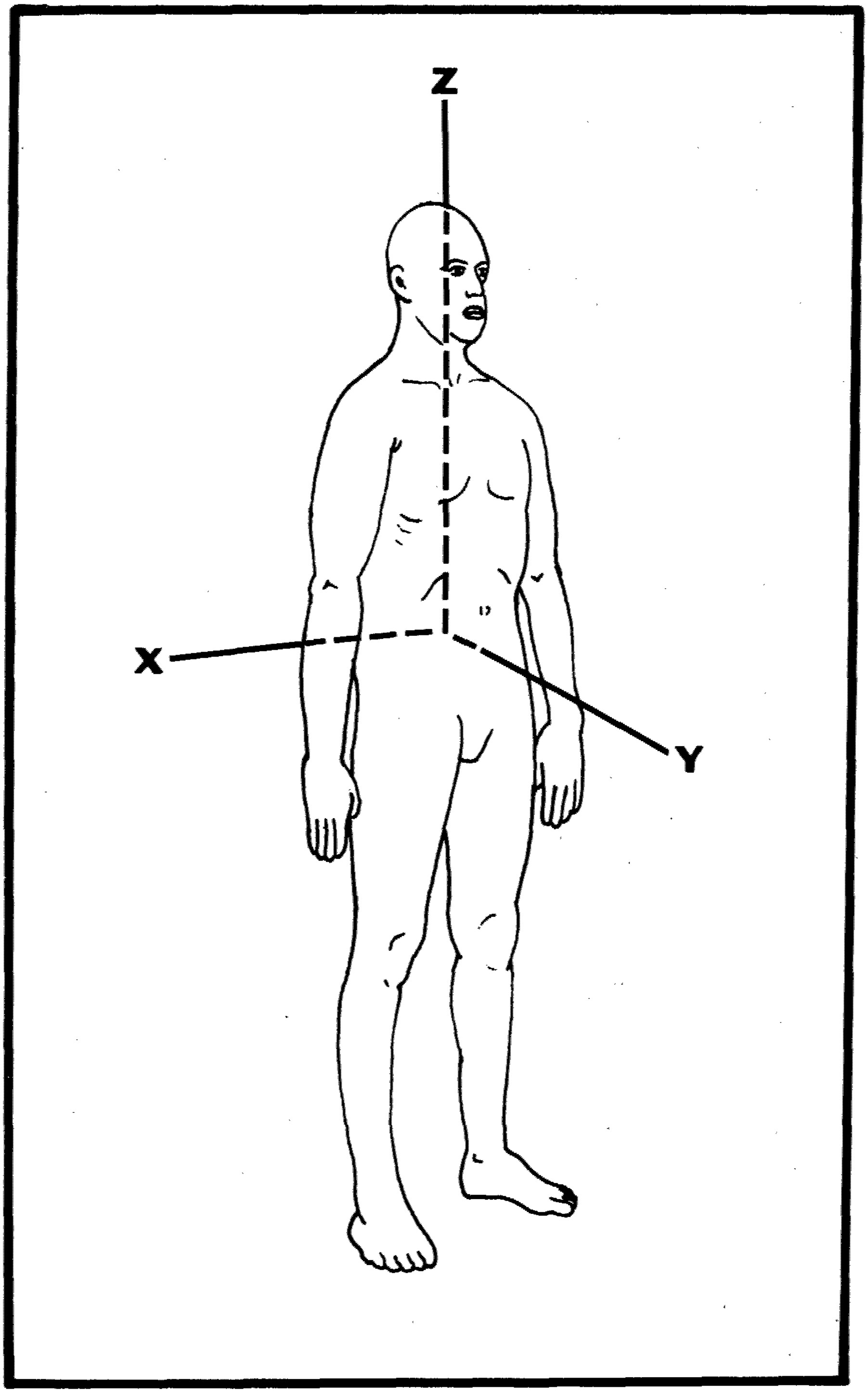


Figure 25 - System of coordinates used for the final data presentation.

The principal moments of inertia of a body defined by a system of coordinates with origin at the center of gravity of the body contain the largest and smallest values of all possible moments. This can be demonstrated as follows.

We know that

$$Ixx = \ell^2xx'Ix'x' + \ell^2xy'Iy'y' + \ell^2xz'Iz'z' \tag{a}$$

is the equation [11] * to obtain Ixx from the principal moments of inertia Ix'x', Iy'y', Iz'z', and from the direction cosines of the new set of axes measured from the old system x', y', z' to the new rotated system x, y, z. The origin is maintained at the body's center of gravity.

From [10] we can say:

$$\ell^2xx' + \ell^2xy' + \ell^2xz' = 1. \tag{b}$$

Now, let us assume that for a certain body we obtain

$$Ix'x' > Iy'y' > Iz'z'. \tag{c}$$

Substituting (b) in (a) yields

$$Ixx = \ell^2xx'Ix'x' + (1 - \ell^2xz' - \ell^2xx')\, Iy'y' + \ell^2xz'Iz'z',$$

which rearranged gives:

$$Ixx = [\,(Ix'x' - Iy'y')\,\ell^2xx'] - [(Iy'y' - Iz'z')\,\ell^2xz'\,] + [Iy'y']. \tag{d}$$

All the terms inside the parentheses are positive due to assumption (c), the fact that we use ℓ^2 and because we are working with the principal axes. Therefore, the maximum value of Ixx must be obtained when the values of ℓ^2xx' = 1 and ℓ^2xz' = 0 are replaced in (d), giving

$$Ixx\ (MAXIMUM) = Ix'x'.$$

This proves that the largest principal moment of inertia is also the largest moment of inertia that can be obtained by any orientation of axes.

In the same way we can prove that the smallest principal moment of inertia is the smallest moment of inertia which can be obtained by any orientation of axes.

If we want to apply the maximum or minimum value concept in relation to

***The numbers in square brackets refer to the computational steps in Appendix 1.**

translation of axes, we must remember that any moment of inertia about a system of parallel axes with origin at the center of gravity corresponds to

$$Ixx = Ix'x' + m\ r^2.$$

Thus, the minimum principal moment of inertia is obtained by setting the origin at the center of gravity of the whole body mass.

In comparing two different sets of principal axes of inertia data which have been generated using different procedures, the largest value of set 1 should be compared with the largest value of set 2 and so on. It is therefore unnecessary to transform one set of coordinates to another pre-established one to compare principal moments of inertia.

The intertial data obtained from the physically segmented standing cadavers were compared with the corresponding inertial data obtained by analytical dissection of the stereometric model. The resulting comparisons are presented in Tables 117 - 122.

SUMMARY AND CONCLUSIONS

The subject of this report constitutes one part of a two part comparative study. Only the biostereometric method and the associated mathematical computations are described here. Although a preliminary analysis indicates a high correlation between the mass distribution data obtained using biostereometrics and the corresponding data obtained using the procedure of Reynolds ***et al.*** (1968), it would be premature to draw definitive conclusions about the comparative findings.

This is the second study of mass distribution involving the use of biostereometrics. The first such study was undertaken as part of an earlier DOT-NHTSA sponsored project (DOT-HS-231-2-397, Herron et al. 1974). On that occasion, three living subjects rode the CAMI pendulum in a sitting position and the periods of oscillation were measured. Stereometric records of each subject taken in the standing position were reduced and the mass distribution properties calculated using the uniform density assumption and otherwise similar procedures to those used here. The period of oscillation of the pendulum for each subject was then computed from the mass distribution data and compared with the results obtained independently using the pendulum procedure. In no case was the difference greater than one per cent.

On mathematical grounds, the use of biostereometrics for quantifying body mass distribution is entirely plausible. The present study further demonstrates that there are no significant practical problems in implementing this approach. A stereometric camera system, based on several years experience with the system used in this study, is expected to become commercially available in the near future

If further examination bears out the first impression of a high correlation between the results obtained with the two procedures used in the present two part study, this can be considered an important step in validating the biostereometric approach, notwithstanding the use of cadavers as subjects.

As more complete and more accurate body density data on normal, living humans become available, the accuracy of the mass distribution figures based on biostereometrics should more closely approximate the "true" values. However, there is a problem in trying to determine what the "true" values really are, since all of the more direct methods which can be used on living humans are obviously fallible themselves.

In establishing validity, we have to be satisfied with the soundness of the mathematical basis combined with enough examples that the biostereometric approach gives mass distribution data which are "in the same ballpark" as those obtained using more traditional procedures.

It is widely recognized that a more convenient and practicable approach to the measurement of mass distribution in larger samples of living humans is badly needed. The results of the current double-blind comparative study should reveal whether biostereometrics, which is the most convenient (particularly from the subject's standpoint) method of acquiring mass distribution thus far developed, is in the realm of acceptability. Expected minor discrepancies due to differences in preferred segmentation schemes, choice of coordinate reference planes and other points of contention which may arise when biostereometrics is used in place of more traditional methods, need present no great difficulty as interest in exploiting the potential of biostereometrics continues to grow. As D'arcy Thompson (1917) pointed out many years ago: "The study of form may be descriptive merely, or it may become analytical. We begin by describing the shape of an object in the simple words of common speech; we end by defining it in the precise language of mathematics; and the one method tends to follow the other in strict scientific order and historical continuity."

It seems inevitable that anthropometry and the quantification of other living organisms will become increasingly stereometric. The ubiquitous digital computer and its growing use for purposes of analysis and simulation rather than simply as a statistical tool makes the need for adequate stereometric input data a matter of some urgency. Whether for computing mass distribution or other relevant biomechanical and biomedical parameters, it is important that the role of biostereometrics be further explored and implemented as deemed appropriate.

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APPENDIX I

Details of Computational Steps

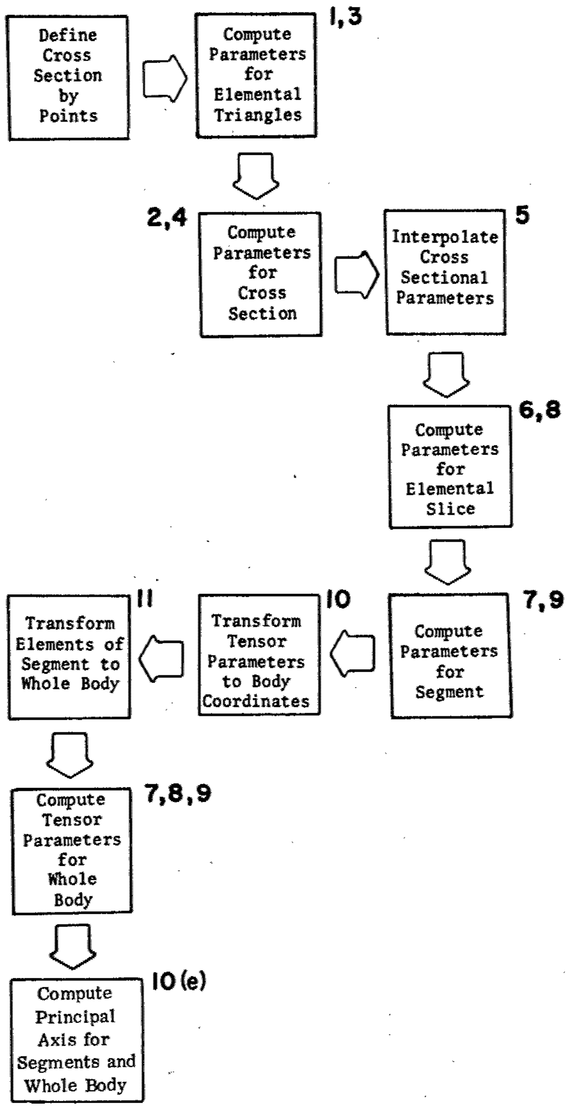
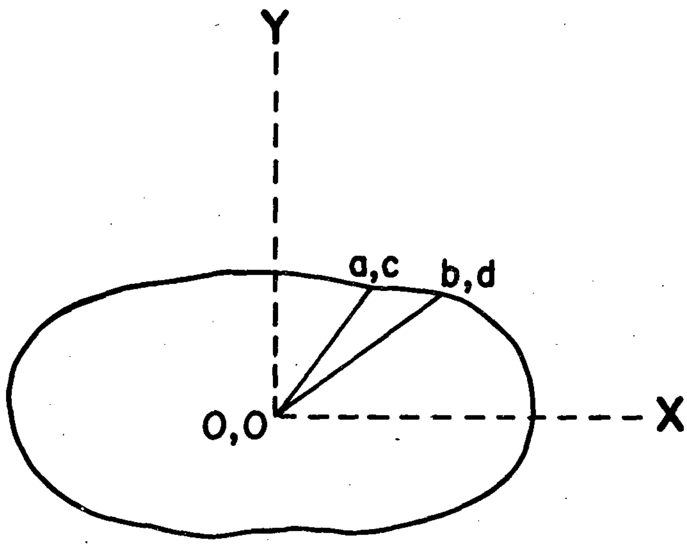


Figure 23 - Computation of body mass distribution parameters.

To Compute Center of Gravity and Surface Area of Elemental Triangle [1]



Input

The coordinates of two consecutive points* (a,c) (b,d) of the cross section with origin at the average of coordinates of all points of the cross section (0,0).

Output

Area of the elemental triangle (s)

$$s = (bc-ad)/2$$

Center of gravity of the elemental triangle (xg,yg)

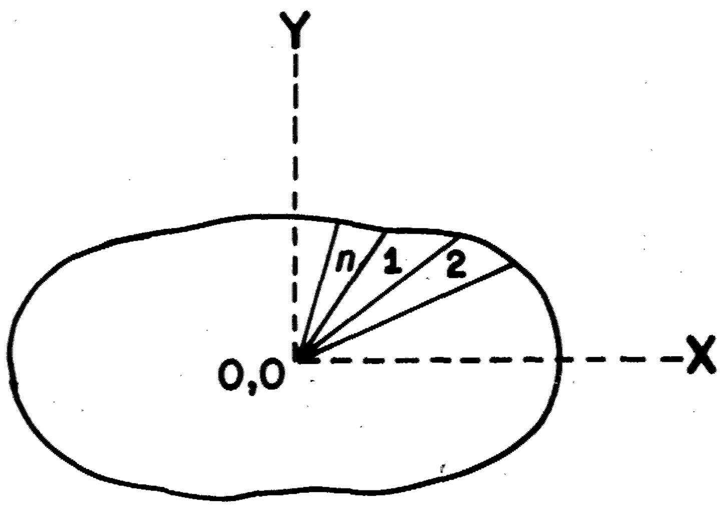
$$xg = (a+b)/3$$

$$yg = (c+d)/3$$

*Note: The points are taken on the perimeter of the cross section so as to permit a linear interpolation between them in order to define the cross section without loss of area. See **Measurements** paragraph.

[2]

To Compute Center of Gravity and Area of a Cross Section



Input

The area (s) and the coordinates (xg,yg) of the center of gravity of the (n) elemental triangles with origin at the average of coordinates of all points of the cross section (0,0).

Output

Cross sectional area (A).

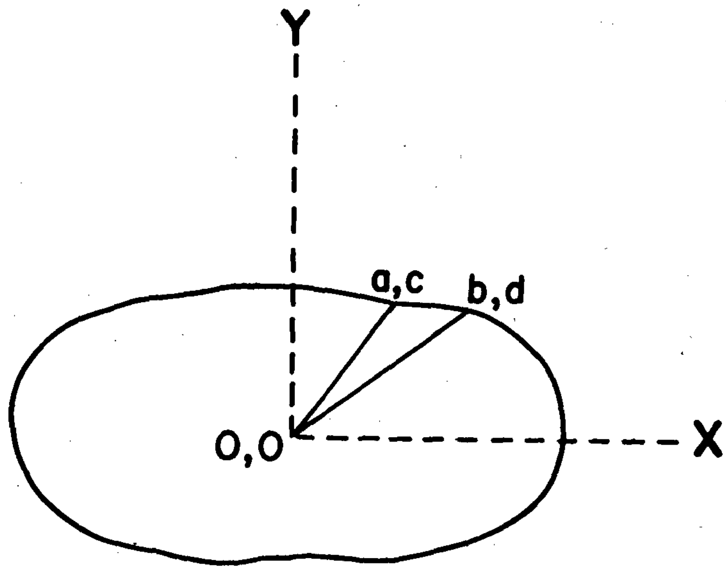
$$A = s_1+s_2+\ldots+s_n$$

Center of gravity of the cross section (XG,YG).

$$XG = (s_1 xg_1+s_2 xg_2+\ldots+s_n xg_n)/A$$

$$YG = (s_1 yg_1+s_2 yg_2+\ldots+s_n yg_n)/A$$

Moments and Products of Inertia for Elemental Triangle with Origin of Coordinates at the Cross Sectional Center of Gravity



Input

The coordinates of two consecutive points (a,c) (b,d) of the cross section with origin at the cross sectional center of gravity (0,0).

Output

Moments of inertia for an elemental triangle (Ixx,Iyy,Izz)

$$Ixx = (bc-ad)\ (cc+cd+dd)/12$$

$$Iyy = (bc-ad)\ (aa+ab+bb)/12$$

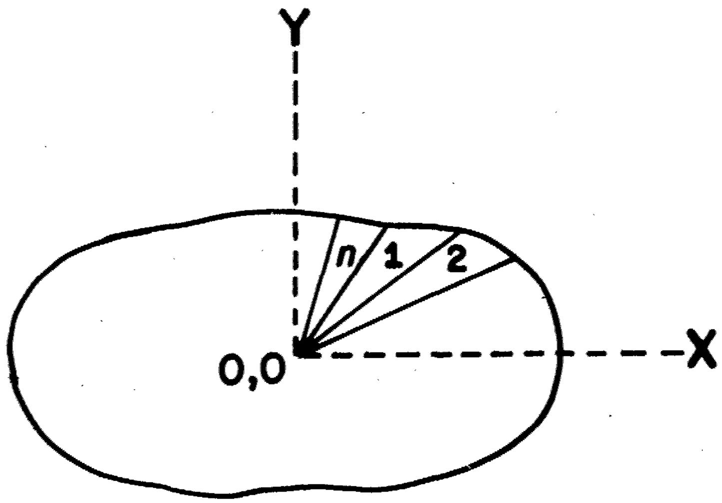
$$Izz = (bc-ad)\ (aa+bb+cc+dd+ab+cd)/12$$

Products of inertia for an elemental triangle (Ixy,Ixz,Iyz)

$$Ixy = (bc-ad)\ (ad+2ac+bc+2bd)/24$$

$$Ixy = Iyz = 0$$

Moments and Products of Inertia for a Cross Section with Origin of Coordinates at the Cross Sectional Center of Gravity



Input

The moments (Ixx, Iyy, Izz) and products (Ixy, Ixz, Iyz) of inertia of the (n) elemental triangles with origin at the cross sectional center of gravity (0,0).

Output

Moments of inertia of a cross section (Ixx,Iyy,Izz)

$$\mathrm{Ixx} = Ixx_1 + Ixx_2 + \ldots + Ixx_n$$

$$\mathrm{Iyy} = Iyy_1 + Iyy_2 + \ldots Iyy_n$$

$$\mathrm{Izz} = Izz_1 + Izz_2 + \ldots Izz_n$$

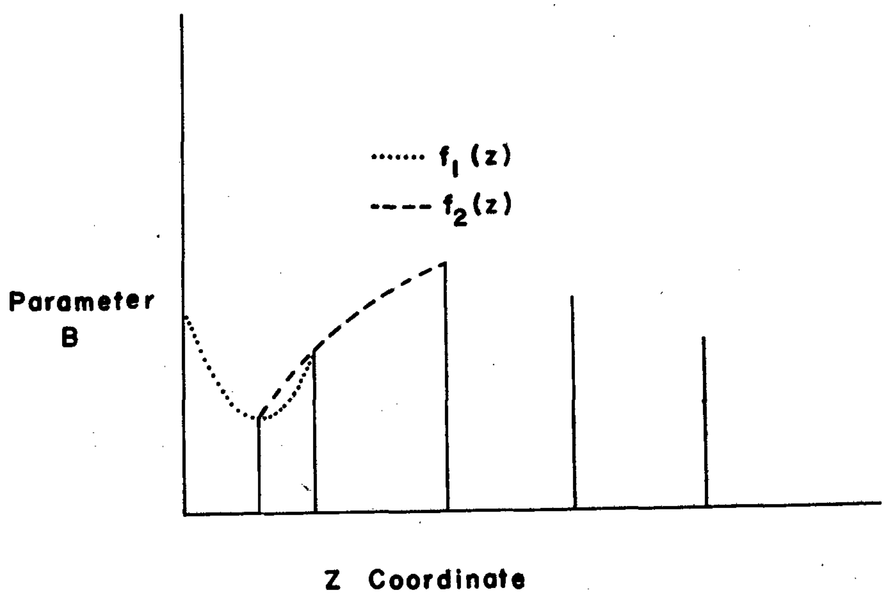
Products of inertia of a cross section (Ixy,Ixz)

$$\mathrm{Ixy} = Ixy_1 + Ixy_2 + \ldots Ixy_n$$

$$\mathrm{Ixz} = Iyz = 0$$

Parabolic Interpolation

of Moments and Products of Inertia, Center of Gravity and Area



Construct a coordinate axis system so that the horizontal axis corresponds to the z-axis of segment and the vertical axis represents the parameter (B) under consideration.

Interpolated values of the parameter can then be computed as follows starting at (z_1, b_1):

Through (z_1, b_1), (z_2, b_2), (z_3, b_3) fit a second order polynomial, $f_1(z)$.

Through (z_2, b_2), (z_3, b_3), (z_4, b_4) fit a second order polynomial, $f_2(z)$.

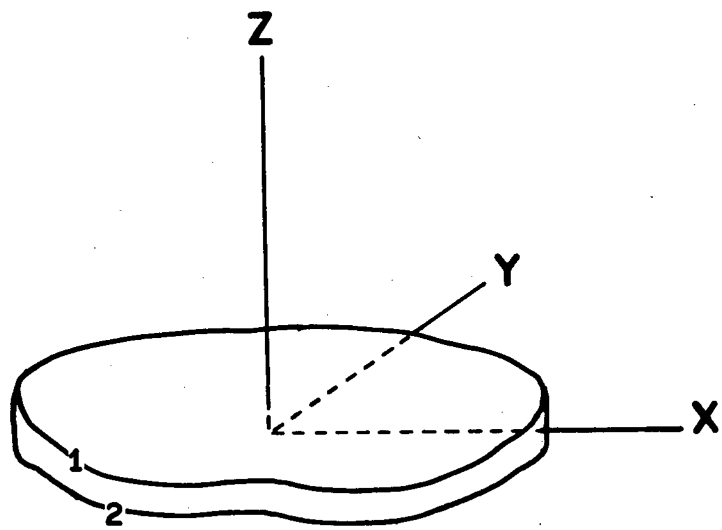
Continue in this manner to construct $f_3, f_4, \ldots f_{k-2}$, where k is the number of data values of parameter B.

Then

$$
\begin{aligned}
b &= f_1(z) && z_1 \le z < z_2 \\
&= f_1(z)+f_2(z)/2 && z_2 \le z < z_3 \\
&= f_2(z)+f_3(z)/2 && z_3 \le z < z_4 \\
&\quad\vdots && \quad\vdots \\
&= f_{k-3}(z)+f_{k-2}(z)/2 && z_{k-2} \le z < z_{k-1} \\
&= f_{k-2}(z) && z_{k-1} \le z \le z_k
\end{aligned}
$$

Evaluate the parameter B at even intervals along Z.

Volume, Center of Gravity, Inertial Moments and Products for a Differential Slice



Input

The Z coordinate (z), moments and products of inertia (*I*), and area (A) and center of gravity (xg,yg) for each pair of consecutive interpolated cross sectional surfaces.

Output

Thickness of the differential slice

$$t = z_1 - z_2$$

Center of gravity of the differential slice

$$XG = (xg_1+xg_2)/2$$
$$YG = (yg_1+yg_2)/2$$
$$ZG = (z_1+z_2)/2$$

Inertial values for the differential slice

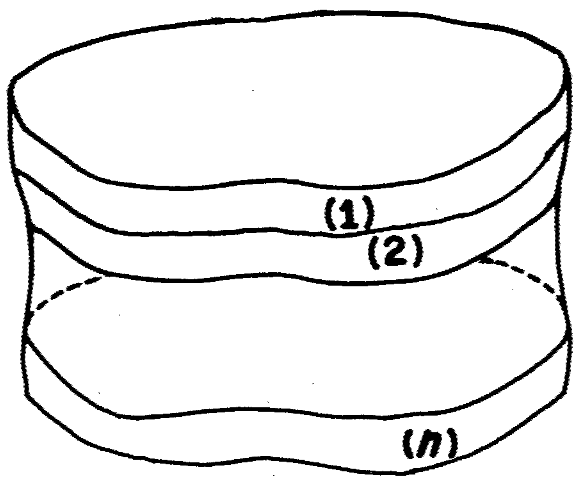
$Ixx = t(Ixx_1+Ixx_2)/2$ — same type of formulae for all moments

$Ixy = t(Ixy_1+Ixy_2)/2$ — same type of formulae for all products

Volume of the differential slice

$$v = t(A_1+A_2)/2$$

Volume and Center of Gravity for a Segment (or for the Whole Body)



Input

The volume (v) and center of gravity (xg,yg,zg) of the (n) differential slices (segments) which composed the segment (whole body).

Output

Volume

$$V = v_1+v_2+\ldots+v_n$$

Center of gravity

$$XG = (v_1 xg_1+v_2 xg_2+\ldots+v_n xg_n)/V$$ same type of formulae for all centers

Moments and Products of Inertia for a Differential Slice at Center of Gravity of Segment (or for a Segment at Center of Gravity of Whole Body)

Input

The center of gravity (xg,yg,zg), volume (V), moments and products of inertia ($\mathcal{I}$) for the differential slice (or segment) and center of gravity (XG,YG,ZG) for the segment (or whole body).

Output

Shift of axis

$$x = xg-XG$$
$$y = yg-YG$$
$$z = zg-ZG$$

Moments of inertia for the slice (the segment)

$\mathbf{I}xx = \mathcal{I}xx+V(y^2+z^2)$ same type of formulae for all moments

Products of inertia for the slice (the segment)

$\mathbf{I}xy = \mathcal{I}xy+V(xy)$ same type of formulae for all products

Moments and Products of Inertia for a Segment with Origin of Coordinates at Segmental Center of Gravity (or Whole Body at Body Center of Gravity)

Input

The moments and products of inertia (I) of (n) differential slices with origins of coordinates at segmental center of gravity (or segments at whole body center of gravity).

Output

Moments of inertia for the segment (whole body)

$Ixx = Ixx_1 + Ixx_2 + \ldots + Ixx_n$ the same type of formulae for all moments

Products of inertia for the segment (whole body)

$Ixy = Ixy_1 + Ixy_2 + \ldots + Ixy_n$ the same type of formulae for all products

For this purpose we use matrix multiplication

$$V = \ell \cdot v + v_0 \qquad \text{(a)}$$

Where:

Vector matrix of transformed coordinates.

$$V = \begin{vmatrix} x \\ y \\ z \end{vmatrix} \qquad \text{(b)}$$

Vector matrix of original coordinates.

$$v = \begin{vmatrix} x' \\ y' \\ z' \end{vmatrix} \qquad \text{(c)}$$

Vector matrix of translation of coordinates.

$$v_0 = \begin{vmatrix} x_0 \\ y_0 \\ z_0 \end{vmatrix} \qquad \text{(d)}$$

Orthogonal rotational matrix of direction cosines of the new axis respect to the old.

$$\ell = \begin{vmatrix} \ell xx' & \ell xy' & \ell xz' \\ \ell yx' & \ell yy' & \ell yz' \\ \ell zx' & \ell zy' & \ell zz' \end{vmatrix} \qquad \text{(e)}$$

[11]

Tensor Transformation

Once we have obtained moments (Ixx,Iyy,Izz) and products of inertia (Ixy,Ixy,Iyz) about a set of axis with origin at the center of gravity, we can write the tensor:

$$I \quad = \quad \begin{vmatrix} Ixx & -Ixy & -Ixz \\ -Iyx & Iyy & -Iyz \\ -Izx & -Izy & Izz \end{vmatrix} \qquad \text{(a)}$$

where I is the inertial tensor and Ixy = Iyx, Ixz = Izx and Iyz = Izy

For the tensor transformation we use the matrix of direction cosines of the new set of axis [10(e)].

So the new tensor (I) is expressed as a function of the old tensor (I) and the matrix of the direction cosines as a function of the new axis with respect to the old (ℓ).

$$\mathrm{I} \;=\; \ell \cdot I \cdot \ell^t \qquad \text{(b)}$$

where ℓ^t is the transposed matrix of ℓ.

APPENDIX II

Introduction to Tables

The first table shows the three different sets of densities for segments, parts and whole body which were used to compute the data in succeeding tables. These values apply to all six subjects. The segment densities shown as "Density 2" and "Density 3" were supplied by the contract monitor. Average densities for the parts and whole body were computed from the segmental densities. The sum of the mass of all segments (or parts) which form the part (or whole body) was divided by the sum of the volumes of those same segments.

Tables 2 - 7 contain the segment lengths, distance from proximal centroid to center of gravity and coordinates of proximal and distal centroids. These values were computed using density 1 but it should be recognized that they must be adjusted for densities 2 and 3 by the values given in Table 8 if absolute coordinate values are to be compared. Table 8 contains the coordinate shifts for the parts and the whole body due to changing from one set of density values to another. Since we have defined all coordinates from the center of gravity of the whole body, and since this point shifts when different densities are assumed for the segments, then the absolute coordinates of the segments and parts will reflect this shift and must be adjusted if they are to be compared for different density sets.

Tables 9 - 80 contain four tables per subject for each density set giving mass, per cent of mass with respect to the whole body, center of gravity, moments of inertia, products of inertia, and principal moments of inertia. The moments and products of inertia were computed using the coordinate reference frame described in the results section.

The principal moments of inertia are given with the origin at the center of gravity. Tables 81 - 116 define the orientation of the principal axes with respect to the coordinate reference frame. These tables list the direction cosines produced in the course of generating the principal moments of inertia for each density, for each subject. The matrix used in these tables is of the type illustrated in computation step [10] (e), described earlier in the section "Computation of Body Mass Distribution Parameters."

Tables 117 - 122 show the data for the standing cadavers measured as a whole, plus the per cent comparison with the data obtained from the segments.

All values are expressed in c.g.s. units where

DENSITY = gm/cm^3

MASS = grams (computed from DENSITY and VOLUME)

VOLUME = cm^3

% MASS is dimensionless

XC.G., YC.G., ZC.G. = cm (coordinates of the center of gravity)

IXX, IYY, IZZ = $gm\text{-}cm^2$ (moments of inertia)

IXY, IXZ, IYZ = $gm\text{-}cm^2$ (products of inertia)

IPX, IPY, IPZ = $gm\text{-}cm^2$ (principal moments of inertia)

SEGMENT LENGTH = cm

PROX–C.G. = cm (distance from proximal centroid to the center of gravity)

PROXIMAL CENTROID, DISTAL CENTROID = cm (x, y, and z coordinates of the centroids)

DIRECTION COSINES are dimensionless

C.G.2 - C.G.1 = cm (coordinate shift due to changing from density set 1 to density set 2)

C.G.3 - C.G.1 = cm (coordinate shift due to changing from density set 1 to density set 3)

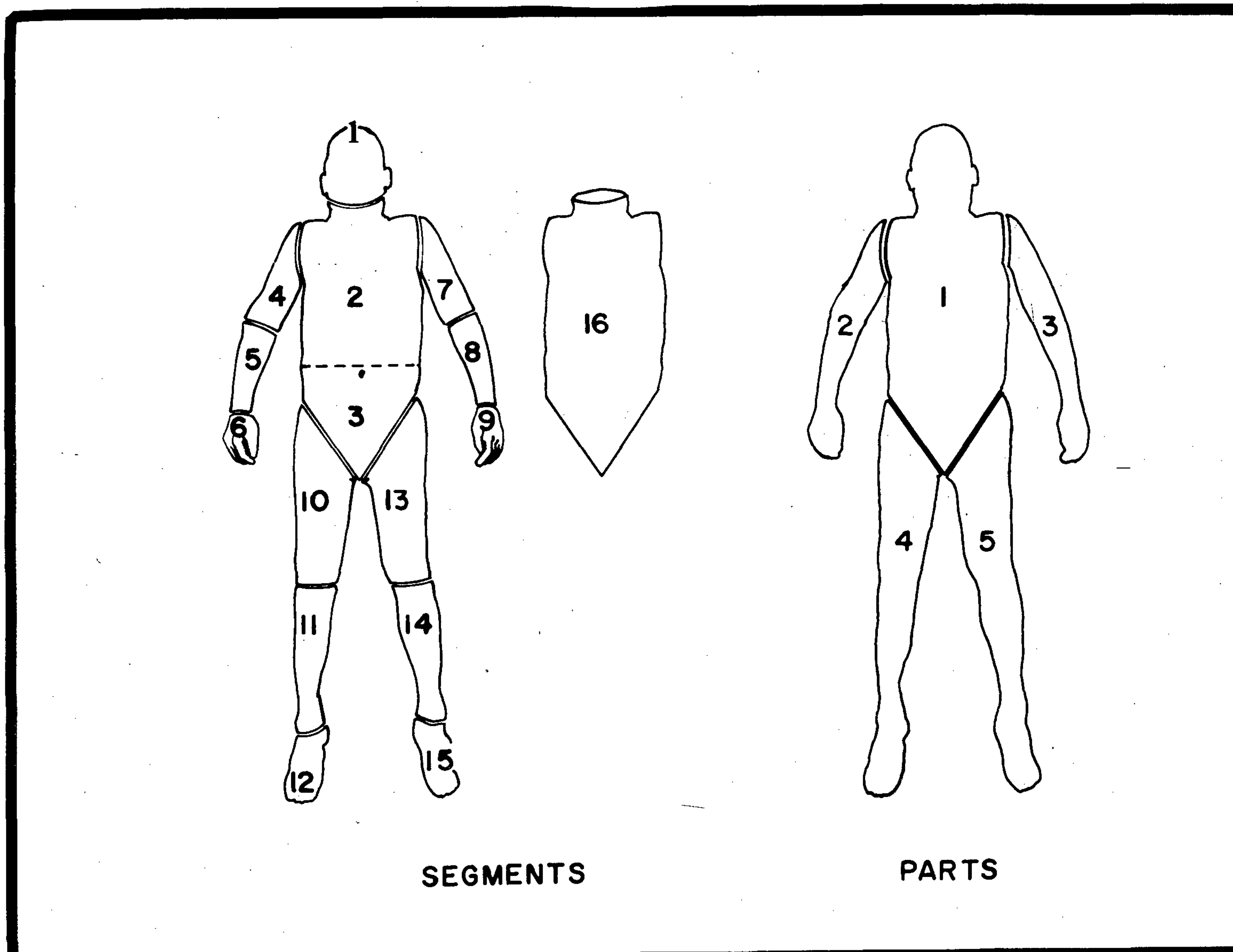


Figure 26 - Segment numbers and body part numbers.

TABLE 1 Subjects 1-6

Density Values

Segment	Density 1	Density 2	Density 3
1	1.000	1.056	1.071
2	1.000	0.853	1.023
3	1.000	0.853	1.023
4	1.000	1.005	1.058
5	1.000	1.052	1.099
6	1.000	1.080	1.108
7	1.000	1.005	1.058
8	1.000	1.052	1.099
9	1.000	1.080	1.108
10	1.000	1.020	1.045
11	1.000	1.065	1.085
12	1.000	1.069	1.085
13	1.000	1.020	1.045
14	1.000	1.065	1.085
15	1.000	1.069	1.085
16	1.000	0.853	1.023

Average Density for Parts

1	1.000	0.873 ± 0.003	1.028 ± 0.001
2	1.000	1.028 ± 0.002	1.077 ± 0.001
3	1.000	1.028 ± 0.001	1.076 ± 0.001
4	1.000	1.036 ± 0.002	1.059 ± 0.001
5	1.000	1.036 ± 0.001	1.059 ± 0.001

Average Density for Whole Body (See paragraph 1, page 53)

1	1.000	0.939 ± 0.004	1.042 ± 0.001

TABLE # 2 SUBJECT 1 DENSITY 1

CENTROID DATA (UNITS: C.G.S.)

#	SEG.LENGTH	PROX.-C.G.	PROXIMAL CENTROID / DISTAL CENTROID X	Y	Z
1	18.7	10.10	-0.9	5.0	66.5
			-0.7	-5.0	50.7
2	53.8	29.11	-0.7	-5.0	50.7
			0.3	0.4	-2.9
3	25.4	8.28	0.2	0.3	-2.8
			2.5	3.2	-28.0
4	24.6	10.19	15.4	-3.8	36.1
			28.1	-6.2	15.2
5	24.9	10.29	28.1	-6.2	15.2
			33.6	-1.7	-8.8
6	14.7	6.01	33.6	-1.7	-8.8
			30.4	-1.2	-23.1
7	24.7	10.33	-16.9	-3.2	37.2
			-28.8	-4.5	15.6
8	26.6	10.31	-28.8	-4.5	15.6
			-34.5	0.6	-9.9
9	15.5	5.90	-34.5	0.6	-9.9
			-32.9	-1.8	-25.2
10	41.1	15.85	8.6	-0.4	-15.1
			14.1	3.1	-55.6
11	38.9	16.29	14.1	3.1	-55.6
			16.8	4.5	-94.4
12	24.8	11.01	16.1	-0.5	-94.4
			16.3	21.3	-106.4
13	40.7	16.60	-8.0	1.2	-15.4
			-12.4	3.6	-55.8
14	38.0	15.76	-12.4	3.6	-55.8
			-14.9	5.4	-93.7
15	24.1	10.78	-11.9	0.6	-93.7
			-17.5	20.8	-105.6
16	79.1	35.73	-0.7	-5.0	50.7
			2.5	3.2	-28.0

TABLE # 3 SUBJECT 2 DENSITY 1

CENTROID DATA (UNITS: C.G.S.)

#	SEG.LENGTH	PROX.-C.G.	X	Y	Z
			PROXIMAL CENTROID / DISTAL CENTROID		
1	17.7	10.04	0.3	4.2	71.8
			0.3	1.2	54.3
2	54.9	29.52	0.3	1.2	54.3
			-0.1	0.5	-0.6
3	21.6	8.40	-0.0	0.4	-0.6
			0.4	1.8	-22.2
4	26.3	11.36	18.5	-0.5	40.2
			29.9	-4.4	16.8
5	29.8	12.89	29.9	-4.4	16.8
			40.5	0.1	-10.6
6	16.4	6.66	40.5	0.1	-10.6
			40.8	1.4	-27.0
7	26.9	10.39	-18.0	-3.5	41.7
			-32.4	-6.1	19.2
8	29.1	11.94	-32.4	-6.1	19.2
			-40.8	-1.3	-8.3
9	16.2	6.79	-40.8	-1.3	-8.3
			-37.9	-3.3	-24.1
10	43.1	16.78	7.8	-1.0	-15.4
			13.6	5.3	-57.7
11	45.6	19.41	13.6	5.3	-57.7
			14.1	5.2	-103.2
12	25.5	10.82	11.6	-0.1	-105.3
			17.5	22.0	-116.5
13	44.2	16.82	-7.8	0.2	-14.3
			-11.4	3.8	-58.2
14	45.8	19.56	-11.4	3.8	-58.2
			-14.3	6.4	-103.8
15	25.3	11.96	-13.4	-0.1	-104.3
			-10.8	22.7	-115.0
16	76.5	35.93	0.3	1.2	54.3
			0.4	1.8	-22.2

TABLE # 4 SUBJECT 3 DENSITY 1

CENTROID DATA (UNITS: C.G.S.)

#	SEG.LENGTH	PROX.-C.G.	PROXIMAL CENTROID DISTAL CENTROID X	Y	Z
1	19.2	10.87	2.0	9.9	71.0
			2.6	-2.1	55.9
2	56.1	30.95	2.6	-2.1	55.9
			-0.0	1.2	0.0
3	27.9	9.21	0.1	1.3	-0.0
			-1.0	-2.9	-27.6
4	22.1	9.19	19.4	-2.2	42.0
			31.1	-6.4	23.7
5	26.1	10.82	31.1	-6.4	23.7
			35.1	-1.1	-1.5
6	14.4	6.20	35.1	-1.1	-1.5
			30.8	-4.8	-14.8
7	25.1	10.13	-16.3	-2.8	43.0
			-30.6	-4.4	22.5
8	25.3	10.78	-30.6	-4.4	22.5
			-42.4	-0.2	0.6
9	14.4	6.29	-42.4	-0.2	0.6
			-41.2	-2.6	-13.5
10	40.1	15.25	7.3	-1.5	-16.1
			11.2	-0.5	-56.0
11	41.6	17.11	11.2	-0.5	-56.0
			13.8	-0.3	-97.5
12	24.1	11.14	13.4	-7.4	-97.4
			10.8	14.0	-108.1
13	42.4	17.24	-10.0	-1.0	-13.4
			-15.5	-0.4	-55.5
14	40.6	16.64	-15.5	-0.4	-55.5
			-20.3	-0.5	-95.8
15	23.3	10.62	-18.1	-7.2	-98.0
			-20.0	13.3	-108.9
16	83.6	38.42	2.6	-2.1	55.9
			-1.0	-2.9	-27.6

TABLE # 5 SUBJECT 4 DENSITY 1

CENTROID DATA (UNITS: C.G.S.)

#	SEG.LENGTH	PROX.-C.G.	PROXIMAL CENTROID DISTAL CENTROID X	Y	Z
1	16.7	9.07	-5.1	15.8	61.5
			-4.2	3.7	50.1
2	58.7	32.69	-4.2	3.7	50.1
			-0.2	-9.4	-7.1
3	21.0	7.52	-0.3	-9.4	-7.1
			3.4	-15.0	-27.0
4	26.2	11.48	13.2	-2.2	35.5
			25.5	-3.9	12.4
5	22.4	7.37	25.5	-3.9	12.4
			23.7	17.3	5.4
6	15.6	6.16	23.7	17.3	5.4
			17.8	26.0	-6.2
7	25.4	11.34	-16.7	-2.1	34.1
			-24.2	-2.6	9.9
8	25.1	9.77	-24.2	-2.6	9.9
			-21.5	20.9	1.5
9	16.8	6.49	-21.5	20.9	1.5
			-11.1	31.7	-6.0
10	38.9	13.70	9.3	-11.0	-18.6
			14.3	21.2	-39.9
11	42.4	18.21	14.3	21.2	-39.9
			13.0	13.9	-81.6
12	24.4	10.71	10.1	7.7	-83.0
			17.5	28.6	-93.1
13	44.0	14.66	-6.5	-11.5	-19.0
			-5.0	25.5	-42.6
14	40.8	17.10	-5.0	25.5	-42.6
			-7.7	15.8	-82.2
15	23.9	10.79	-6.7	9.9	-81.3
			-16.5	28.0	-93.4
16	79.6	39.43	-4.2	3.7	50.1
			3.4	-15.0	-27.0

TABLE # 6 SUBJECT 5 DENSITY 1

CENTROID DATA (UNITS: C.G.S.)

#	SEG.LENGTH	PROX.-C.G.	PROXIMAL CENTROID / DISTAL CENTROID X	Y	Z
1	19.8	11.18	1.5	10.5	62.3
			-0.2	-3.5	48.4
2	51.7	29.05	-0.2	-3.5	48.4
			0.2	-10.3	-2.8
3	20.8	7.40	0.1	-10.3	-2.9
			0.5	-16.0	-22.8
4	23.5	10.58	17.5	-2.5	31.8
			27.4	-4.1	10.6
5	26.2	10.32	27.4	-4.1	10.6
			23.0	20.8	3.7
6	16.2	6.59	23.0	20.8	3.7
			11.7	27.2	-6.0
7	22.7	10.14	-17.9	-2.7	31.0
			-27.6	-6.1	10.8
8	25.1	9.59	-27.6	-6.1	10.8
			-28.7	18.6	6.6
9	14.1	6.74	-28.7	18.6	6.6
			-22.1	28.7	-0.7
10	42.7	16.12	7.8	-11.3	-14.1
			15.0	25.1	-35.3
11	41.9	18.37	15.0	25.1	-35.3
			9.8	14.9	-75.7
12	24.4	10.75	7.0	8.8	-74.9
			9.5	24.0	-93.9
13	38.7	15.09	-8.9	-10.6	-14.6
			-13.4	22.5	-34.2
14	42.2	18.25	-13.4	22.5	-34.2
			-15.9	16.0	-75.7
15	24.3	10.95	-16.5	9.7	-75.2
			-15.5	25.7	-93.6
16	72.3	35.07	-0.2	-3.5	48.4
			0.5	-16.0	-22.8

TABLE # 7 SUBJECT 6 DENSITY 1

CENTROID DATA (UNITS: C.G.S.)

#	SEG.LENGTH	PROX.-C.G.	PROXIMAL CENTROID DISTAL CENTROID		
			X	Y	Z
1	18.1	9.82	-0.9	14.1	55.2
			0.1	-0.5	44.5
2	46.7	26.21	0.1	-0.5	44.5
			-0.2	-9.0	-1.5
3	25.9	9.13	-0.1	-9.0	-1.4
			1.2	-11.7	-27.2
4	24.1	10.45	17.5	-4.4	29.4
			26.4	-6.6	7.1
5	23.9	9.58	26.4	-6.6	7.1
			29.7	16.2	0.8
6	12.8	5.63	29.7	16.2	0.8
			23.6	27.4	-0.3
7	22.9	10.37	-16.6	-2.9	31.2
			-25.5	-4.6	10.2
8	24.5	9.46	-25.5	-4.6	10.2
			-25.9	18.5	2.0
9	14.3	5.85	-25.9	18.5	2.0
			-17.5	29.9	0.5
10	38.2	15.21	7.9	-10.3	-16.6
			14.8	20.8	-37.7
11	38.9	15.64	14.8	20.8	-37.7
			14.0	13.8	-75.9
12	23.2	10.45	9.2	11.9	-74.2
			21.9	20.0	-91.8
13	38.4	14.96	-8.7	-7.4	-15.5
			-14.8	24.3	-36.4
14	41.6	17.14	-14.8	24.3	-36.4
			-12.4	15.7	-77.0
15	23.5	10.33	-9.5	11.6	-75.4
			-13.0	26.5	-93.2
16	72.6	33.66	0.1	-0.5	44.5
			1.2	-11.7	-27.2

TABLE 8 Units: c.g.s.

Shift of C.G. with Different Density Sets

	C.G.2 - C.G.1			C.G.3 - C.G.1		
Subject 1	X	Y	Z	X	Y	Z
Parts						
1	0.0	0.1	0.9	0.0	0.0	0.2
2	0.1	0.0	-0.4	0.1	0.0	-0.3
3	-0.1	0.0	-0.4	-0.1	0.0	-0.3
4	0.0	0.0	-0.5	0.0	0.0	-0.4
5	0.0	0.0	-0.5	0.0	0.0	-0.4
Whole Body						
1	0.0	0.1	-1.7	0.0	0.0	-0.4
Subject 2						
Parts						
1	0.0	0.1	0.8	0.0	0.0	0.2
2	0.2	0.0	-0.5	0.1	0.0	-0.3
3	-0.2	0.0	-0.5	-0.1	0.0	-0.3
4	0.0	0.0	-0.6	0.0	0.0	-0.5
5	0.0	0.0	-0.6	0.0	0.0	-0.5
Whole Body						
1	0.0	0.1	-2.1	0.0	0.0	-0.5
Subject 3						
Parts						
1	0.0	0.1	0.8	0.0	0.0	0.2
2	0.1	0.0	-0.4	0.1	0.0	-0.3
3	-0.2	0.0	-0.4	-0.1	0.0	-0.3
4	0.0	0.0	-0.5	0.0	0.0	-0.4
5	-0.1	0.0	-0.5	0.0	0.0	-0.4
Whole Body						
1	-0.1	-0.1	-1.9	0.0	0.0	-0.4

TABLE 8 (continued) Units: c.g.s.

Shift of C.G. with Different Density Sets

	C.G.2 - C.G.1			C.G.3 - C.G.1		
Subject 4	X	Y	Z	X	Y	Z
Parts						
1	-0.1	0.3	0.9	0.0	0.1	0.2
2	0.1	0.2	-0.3	0.1	0.1	-0.2
3	0.0	0.2	-0.3	0.0	0.2	-0.2
4	0.0	0.2	-0.4	0.0	0.2	-0.4
5	0.0	0.2	-0.4	0.0	0.2	-0.3
Whole Body						
1	0.1	0.7	-1.4	0.0	0.2	-0.3
Subject 5						
Parts						
1	0.0	0.3	1.0	0.0	0.1	0.2
2	0.0	0.2	-0.2	0.0	0.2	-0.2
3	-0.1	0.2	-0.2	0.0	0.2	-0.2
4	0.0	0.2	-0.4	0.0	0.1	-0.3
5	0.0	0.2	-0.4	0.0	0.2	-0.3
Whole Body						
1	0.0	0.7	-1.4	0.0	0.2	-0.3
Subject 6						
Parts						
1	0.0	0.3	0.7	0.0	0.1	0.2
2	0.1	0.2	-0.2	0.1	0.1	-0.2
3	-0.1	0.2	-0.2	0.0	0.1	-0.2
4	0.0	0.1	-0.4	0.0	0.1	-0.3
5	0.0	0.2	-0.4	0.0	0.1	-0.3
Whole Body						
1	0.0	0.7	-1.3	0.0	0.2	-0.3

TABLE # 9 SUBJECT 1 DENSITY 1

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.000	4041.0	6.47	-0.7	2.0	56.9
2	1.000	26901.1	43.06	-0.6	-1.1	21.8
3	1.000	6774.2	10.84	0.5	1.0	-11.1
4	1.000	1926.7	3.08	21.6	-5.2	28.1
5	1.000	963.1	1.54	30.8	-4.4	5.4
6	1.000	410.2	0.66	33.3	-0.4	-14.6
7	1.000	2017.4	3.23	-23.0	-4.2	28.9
8	1.000	941.8	1.51	-31.8	-2.7	5.9
9	1.000	347.9	0.56	-34.5	0.9	-15.8
10	1.000	6206.9	9.93	12.0	1.0	-30.5
11	1.000	2212.2	3.54	16.1	2.2	-71.8
12	1.000	811.5	1.30	17.5	8.8	-100.2
13	1.000	5950.3	9.52	-10.4	1.4	-31.8
14	1.000	2204.6	3.53	-13.7	2.7	-71.5
15	1.000	771.6	1.23	-15.4	8.7	-99.9
16	1.000	33675.3	53.90	-0.4	-0.7	15.2
PARTS						
1	1.000	37716.3	60.36	-0.5	-0.4	19.7
2	1.000	3300.0	5.28	25.7	-4.3	16.2
3	1.000	3307.1	5.29	-26.7	-3.2	17.6
4	1.000	9230.6	14.77	13.5	2.0	-46.5
5	1.000	8926.5	14.29	-11.7	2.3	-47.5
WHOLE BODY						
1	1.000	62480.4	100.00	0.0	0.0	0.0

TABLE # 10 SUBJECT 1 DENSITY 1

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	203360.2	158070.6	165116.3
2	5683885.8	6959038.6	2765940.8
3	371685.2	506851.5	443712.5
4	115499.1	130548.4	46332.7
5	44967.6	45355.5	10413.1
6	6812.1	7197.9	3242.5
7	123121.8	135858.1	46948.1
8	46512.2	46691.2	10605.2
9	4607.1	4938.4	2295.7
10	1123339.1	1120877.6	156831.0
11	279061.1	281603.1	26918.0
12	29766.0	11065.5	24478.7
13	965638.1	972060.2	151131.5
14	249144.0	251291.3	27726.1
15	27153.6	13362.1	21219.0
16	11937540.3	13331594.2	3238871.7
PARTS			
1	18431334.5	19754281.3	3430293.7
2	949768.5	1039184.5	148826.4
3	956395.7	1034665.2	141248.5
4	6829511.6	6807627.5	293032.2
5	6130606.9	6117412.3	265295.3
WHOLE BODY			
1	90080389.2	98798562.4	11911880.9

TABLE # 11 SUBJECT 1 DENSITY 1

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	4056.3	-2191.6	-30019.0
2	3165.2	-42289.0	-334099.5
3	3826.7	10861.6	-8971.3
4	-7859.3	-44072.4	14776.7
5	2054.9	-8801.3	-8205.2
6	-570.2	205.3	-203.4
7	4944.0	44390.6	8338.8
8	-2010.4	8578.1	-9111.9
9	522.4	-122.0	121.1
10	4696.1	-10056.7	-93009.5
11	1596.8	-27067.4	-8141.5
12	1377.7	-1397.7	-9605.1
13	-2585.1	428.6	-71576.9
14	-2982.1	21947.9	-14179.7
15	-4249.5	3359.1	-9557.1
16	19128.2	-226230.5	-708104.0
PARTS			
1	20662.6	-267521.0	-334068.6
2	12213.2	-295851.7	-61831.9
3	-17581.6	283902.6	-76839.8
4	40297.7	-501776.8	-521544.7
5	-36693.5	397715.4	-458861.2
WHOLE BODY			
1	-56469.3	-1742076.2	-3967127.9

TABLE # 12 SUBJECT 1 DENSITY 1

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	203732.5	131089.7	191724.9
2	5684496.4	6985492.2	2738876.5
3	370037.7	508308.6	443902.9
4	137028.5	133041.6	22310.1
5	47038.2	47236.8	6461.1
6	6428.6	7607.5	3216.5
7	143670.6	136556.8	25700.6
8	48863.9	48449.6	6495.2
9	4225.1	5330.3	2285.9
10	1131488.5	1121731.7	147827.5
11	281172.1	282630.0	23780.1
12	30336.7	5910.9	29062.5
13	965147.0	978745.9	144936.9
14	250109.4	253395.9	24656.1
15	28669.3	5603.8	27461.6
16	11943419.6	13381040.2	3183546.4
PARTS			
1	18435940.8	19761289.1	3418679.7
2	1053152.4	1037175.7	47451.2
3	1049856.4	1036581.7	45871.3
4	6867819.4	6849109.4	213242.6
5	6161411.5	6149273.1	202629.9
WHOLE BODY			
1	90117113.8	98981720.9	11692678.9

TABLE # 13 SUBJECT 1 DENSITY 2

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.056	4267.3	7.29	-0.7	1.9	58.6
2	0.853	22946.6	39.17	-0.7	-1.2	23.6
3	0.853	5778.4	9.86	0.4	0.9	-9.4
4	1.005	1936.3	3.31	21.6	-5.3	29.8
5	1.052	1013.2	1.73	30.8	-4.5	7.1
6	1.080	443.1	0.76	33.3	-0.5	-12.9
7	1.005	2027.5	3.46	-23.0	-4.3	30.6
8	1.052	990.8	1.69	-31.8	-2.8	7.6
9	1.080	375.7	0.64	-34.5	0.8	-14.1
10	1.020	6331.1	10.81	12.0	0.9	-28.7
11	1.065	2356.0	4.02	16.0	2.1	-70.0
12	1.069	867.5	1.48	17.5	8.7	-98.5
13	1.020	6069.3	10.36	-10.5	1.3	-30.1
14	1.065	2347.9	4.01	-13.7	2.6	-69.8
15	1.069	824.8	1.41	-15.5	8.6	-98.2
16	0.853	28725.0	49.04	-0.5	-0.7	16.9
PARTS						
1	0.875	32992.3	56.32	-0.5	-0.4	22.3
2	1.028	3392.5	5.79	25.8	-4.4	17.5
3	1.026	3394.0	5.79	-26.9	-3.3	18.9
4	1.035	9554.5	16.31	13.5	1.9	-45.3
5	1.035	9242.0	15.78	-11.8	2.3	-46.3
WHOLE BODY						
1	0.937	58575.3	100.00	0.0	0.0	0.0

TABLE # 14 SUBJECT 1 DENSITY 2

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	214748.3	166922.5	174362.8
2	4848354.5	5936059.8	2359347.4
3	317047.5	432344.3	378486.8
4	116076.5	131201.0	46564.4
5	47305.9	47713.9	10954.6
6	7357.1	7773.8	3501.9
7	123737.3	136537.3	47182.8
8	48930.7	49119.1	11156.7
9	4975.7	5333.5	2479.4
10	1145805.3	1143294.5	159967.6
11	297200.0	299907.2	28667.6
12	31819.8	11829.0	26167.7
13	984950.4	991500.9	154154.0
14	265338.2	267625.1	29528.3
15	29027.2	14284.1	22683.1
16	10182721.9	11371849.9	2762757.5
PARTS			
1	16875004.2	17989720.8	2964208.4
2	991424.0	1083720.5	153628.9
3	998861.7	1079765.8	145757.5
4	7158155.1	7134465.9	304441.1
5	6426142.0	6411501.4	275324.5
WHOLE BODY			
1	90684069.5	99482763.9	11770570.2

TABLE # 15 SUBJECT 1 DENSITY 2

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	4283.4	-2314.3	-31700.1
2	2699.9	-36072.6	-284986.8
3	3264.2	9265.0	-7652.6
4	-7898.6	-44292.7	14850.6
5	2161.7	-9259.0	-8631.8
6	-615.9	221.7	-219.7
7	4968.7	44612.5	8380.5
8	-2114.9	9024.2	-9585.7
9	564.2	-131.8	130.8
10	4790.1	-10257.8	-94869.6
11	1700.6	-28826.8	-8670.7
12	1472.8	-1494.2	-10267.9
13	-2636.8	437.2	-73008.4
14	-3175.9	23374.5	-15101.4
15	-4542.7	3590.9	-10216.6
16	16316.4	-192974.6	-604012.7
PARTS			
1	18002.9	-235550.8	-219640.3
2	13217.8	-307159.9	-66197.3
3	-18674.2	294977.0	-81500.0
4	42389.2	-527973.7	-547924.0
5	-38729.9	418857.5	-482398.2
WHOLE BODY			
1	-64184.1	-1731437.1	-3946452.5

TABLE # 16 SUBJECT 1 DENSITY 2

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	215141.4	138430.7	202461.4
2	4848875.3	5958624.8	2336261.6
3	315642.2	433587.2	378649.1
4	137713.6	133706.7	22421.6
5	49484.2	49693.1	6797.1
6	6942.9	8216.1	3473.8
7	144388.8	137239.5	25829.1
8	51404.7	50968.9	6832.9
9	4563.1	5756.7	2468.7
10	1154117.7	1144165.7	150784.0
11	299448.2	301000.8	25325.8
12	32429.9	6318.8	31067.8
13	984449.5	998320.4	147835.5
14	266366.4	269866.5	26258.7
15	30647.5	5990.5	29356.4
16	10187737.0	11414027.3	2715565.0
PARTS			
1	16878808.6	17993121.0	2957003.9
2	1098266.3	1081765.8	48741.5
3	1095511.5	1081904.6	46968.9
4	7198597.7	7178138.2	220326.3
5	6458448.8	6445342.3	209176.7
WHOLE BODY			
1	90719506.2	99662217.0	11555680.4

TABLE # 17 SUBJECT 1 DENSITY 3

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.071	4327.9	6.65	-0.7	2.0	57.2
2	1.023	27519.8	42.27	-0.7	-1.1	22.2
3	1.023	6930.0	10.65	0.4	1.0	-10.7
4	1.058	2038.4	3.13	21.6	-5.2	28.4
5	1.099	1058.4	1.63	30.8	-4.4	5.8
6	1.108	454.5	0.70	33.3	-0.4	-14.3
7	1.058	2134.4	3.28	-23.0	-4.2	29.2
8	1.099	1035.0	1.59	-31.8	-2.7	6.2
9	1.108	385.4	0.59	-34.5	0.9	-15.5
10	1.045	6486.2	9.96	12.0	0.9	-30.1
11	1.085	2400.2	3.69	16.1	2.2	-71.4
12	1.085	880.5	1.35	17.5	8.8	-99.9
13	1.045	6218.0	9.55	-10.4	1.4	-31.5
14	1.085	2392.0	3.67	-13.7	2.7	-71.2
15	1.085	837.1	1.29	-15.4	8.6	-99.6
16	1.023	34449.8	52.92	-0.4	-0.7	15.6
PARTS						
1	1.028	38777.7	59.57	-0.5	-0.4	20.2
2	1.076	3551.4	5.46	25.8	-4.3	16.2
3	1.075	3554.9	5.46	-26.8	-3.2	17.7
4	1.058	9766.9	15.00	13.5	2.0	-46.5
5	1.058	9447.2	14.51	-11.7	2.3	-47.6
WHOLE BODY						
1	1.042	65098.1	100.00	0.0	0.0	0.0

TABLE # 18 SUBJECT 1 DENSITY 3

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	217798.6	169293.4	176839.4
2	5814613.8	7119094.8	2829556.8
3	380233.9	518508.9	453917.8
4	122198.0	138120.1	49020.0
5	49419.4	49845.7	11444.0
6	7547.8	7975.3	3592.7
7	130262.8	143737.8	49671.1
8	51116.9	51313.7	11655.1
9	5104.7	5471.7	2543.7
10	1173888.4	1171316.1	163888.3
11	302781.1	305539.1	29206.0
12	32296.1	12006.0	26559.3
13	1009091.0	1015802.1	157932.3
14	270321.0	272650.8	30082.8
15	29461.6	14497.9	23022.6
16	12212100.9	13638217.7	3313365.0
PARTS			
1	19133250.7	20483350.1	3518236.9
2	1031062.0	1127534.8	160511.2
3	1038778.5	1123321.0	152321.7
4	7299370.2	7275441.2	310887.2
5	6552811.7	6538093.1	281211.7
WHOLE BODY			
1	95675237.9	104982272.0	12633746.1

TABLE # 19 SUBJECT 1 DENSITY 3

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	4344.3	-2347.2	-32150.3
2	3238.0	-43261.7	-341783.7
3	3914.7	11111.5	-9177.7
4	-8315.1	-46628.5	15633.8
5	2258.3	-9672.7	-9017.5
6	-631.8	227.5	-225.4
7	5230.8	46965.2	8822.4
8	-2209.4	9427.3	-10014.0
9	578.8	-135.2	134.2
10	4907.5	-10509.2	-97194.8
11	1732.5	-29368.1	-8833.6
12	1494.8	-1516.5	-10421.6
13	-2701.4	447.9	-74797.8
14	-3235.6	23813.5	-15385.0
15	-4610.7	3644.7	-10369.5
16	19568.2	-231433.7	-724390.2
PARTS			
1	21225.0	-275446.4	-325963.2
2	13572.1	-320180.9	-68208.9
3	-19317.2	307451.9	-84300.4
4	43172.2	-538128.1	-558126.4
5	-39424.1	426809.7	-491355.8
WHOLE BODY			
1	-63125.6	-1843320.0	-4208327.4

TABLE # 20 SUBJECT 1 DENSITY 3

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	218197.3	140397.0	205337.2
2	5815238.4	7146156.9	2801870.0
3	378548.5	519999.6	454112.5
4	144976.1	140757.9	23604.1
5	51695.0	51913.3	7100.8
6	7122.9	8429.1	3563.8
7	152003.4	144477.1	27191.2
8	53701.4	53246.1	7138.2
9	4681.4	5906.0	2532.7
10	1182404.5	1172208.6	154479.6
11	305071.5	306653.3	25801.4
12	32915.3	6413.3	31532.8
13	1008577.8	1022788.6	151458.9
14	271368.4	274934.3	26751.9
15	31106.2	6080.1	29795.8
16	12218115.4	13688801.0	3256767.2
PARTS			
1	19137931.0	20489798.5	3507108.2
2	1142663.9	1125437.6	51006.5
3	1139727.9	1125488.6	49204.6
4	7340574.0	7319879.9	225244.8
5	6585756.4	6572476.9	213883.2
WHOLE BODY			
1	95713553.3	105175926.1	12401776.5

TABLE # 21 SUBJECT 2 DENSITY 1

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.000	4196.4	5.33	0.1	1.8	62.0
2	1.000	34681.6	44.07	0.0	-1.5	24.9
3	1.000	8156.3	10.37	0.0	0.7	-9.0
4	1.000	2109.5	2.68	24.0	-3.0	30.6
5	1.000	1165.8	1.48	34.5	-2.9	4.9
6	1.000	494.1	0.63	42.4	0.7	-17.0
7	1.000	2328.4	2.96	-24.1	-5.3	33.5
8	1.000	1160.0	1.47	-36.1	-3.8	8.1
9	1.000	422.6	0.54	-41.1	-0.5	-15.0
10	1.000	7582.4	9.64	11.6	1.7	-31.5
11	1.000	2887.6	3.67	14.5	4.2	-77.0
12	1.000	1096.5	1.39	14.6	9.2	-109.9
13	1.000	8278.9	10.52	-10.7	1.2	-30.8
14	1.000	3016.1	3.83	-13.6	3.5	-77.6
15	1.000	1113.5	1.42	-12.9	10.3	-110.2
16	1.000	42837.9	54.44	0.0	-1.1	18.5
PARTS						
1	1.000	47034.3	59.77	0.0	-0.9	22.4
2	1.000	3769.4	4.79	29.7	-2.5	16.4
3	1.000	3911.1	4.97	-29.5	-4.4	20.7
4	1.000	11566.4	14.70	12.6	3.0	-50.3
5	1.000	12408.6	15.77	-11.6	2.6	-49.3
WHOLE BODY						
1	1.000	78689.7	100.00	0.0	0.0	0.0

TABLE # 22 SUBJECT 2 DENSITY 1

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	227850.3	161863.6	189803.8
2	8249682.0	10154966.4	4407641.5
3	523170.3	613863.0	608131.9
4	150391.7	154147.6	42705.6
5	59211.9	65743.5	19791.0
6	9793.3	9037.5	4539.4
7	165743.6	184229.1	58004.2
8	69882.4	76945.8	18804.8
9	8159.1	8057.3	2854.6
10	1428459.4	1404080.7	235615.5
11	515500.5	516624.5	34863.4
12	43741.9	21115.2	33048.2
13	1609148.7	1578771.0	261619.9
14	525761.1	522134.8	41389.7
15	44086.8	19913.7	35332.8
16	16420824.4	18384347.2	5048231.1
PARTS			
1	23938131.9	25802723.4	5271067.1
2	1354459.3	1533292.6	247837.8
3	1360598.0	1551828.2	262705.2
4	10687022.3	10604945.8	384710.3
5	11631567.6	11509591.2	443941.0
WHOLE BODY			
1	134965786.4	146901524.0	17160375.9

TABLE # 23 SUBJECT 2 DENSITY 1

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	2820.7	-2321.9	-37851.7
2	41771.3	22230.5	-660128.8
3	-3103.6	-10482.3	-8288.7
4	-9530.5	-37970.1	18684.8
5	3953.5	-20643.1	-8720.0
6	-334.3	-994.1	109.5
7	8288.7	57920.1	12270.7
8	-4008.0	22254.2	-10787.0
9	232.8	-567.3	-137.1
10	11499.5	-27832.6	-170288.2
11	2406.4	-16171.2	-4102.2
12	4356.6	-2811.9	-14661.0
13	3329.0	-51214.7	-133714.6
14	-3442.7	29827.7	-33685.3
15	4766.6	-2563.8	-13949.2
16	38433.4	15336.2	-1165578.8
PARTS			
1	42456.1	30841.3	-714166.7
2	17656.0	-503924.9	-51737.9
3	-30267.7	511923.0	-92738.0
4	48378.3	-468910.8	-869179.7
5	-22859.1	375731.0	-996629.1
WHOLE BODY			
1	344967.4	-783436.2	-7488871.0

TABLE # 24 SUBJECT 2 DENSITY 1

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	228000.8	135342.9	216174.0
2	8248781.4	10230790.7	4332717.7
3	521848.6	620548.5	602768.0
4	155791.6	164166.7	27286.6
5	68099.3	67312.0	9335.2
6	10068.3	8950.4	4351.5
7	192088.6	184500.9	31387.3
8	78216.7	78882.8	8533.5
9	8371.4	7909.9	2789.7
10	1436233.4	1421317.1	210605.0
11	514064.3	518640.4	34283.7
12	44554.9	10445.9	42904.6
13	1611250.5	1592036.9	246252.2
14	528110.4	523975.9	37199.3
15	44996.6	10806.5	43530.2
16	16420077.1	18486212.3	4947113.3
PARTS			
1	23937176.9	25828535.8	5246209.6
2	1549877.9	1534969.5	50742.4
3	1566374.6	1554043.7	54713.1
4	10710747.2	10675979.0	289952.2
5	11646485.0	11596260.2	342354.6
WHOLE BODY			
1	134962228.9	147337967.1	16724209.5

TABLE # 25 SUBJECT 2 DENSITY 2

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.056	4431.4	6.01	0.1	1.7	64.2
2	0.853	29583.4	40.14	0.0	-1.7	27.1
3	0.853	6957.3	9.44	0.0	0.5	-6.9
4	1.005	2120.0	2.88	24.0	-3.2	32.7
5	1.052	1226.4	1.66	34.5	-3.1	7.0
6	1.080	533.6	0.72	42.4	0.5	-14.9
7	1.005	2340.1	3.18	-24.1	-5.5	35.7
8	1.052	1220.3	1.66	-36.1	-4.0	10.2
9	1.080	456.4	0.62	-41.1	-0.7	-12.9
10	1.020	7734.1	10.49	11.6	1.6	-29.4
11	1.065	3075.2	4.17	14.5	4.0	-74.9
12	1.069	1172.1	1.59	14.6	9.0	-107.8
13	1.020	8444.5	11.46	-10.7	1.1	-28.7
14	1.065	3212.2	4.36	-13.6	3.4	-75.5
15	1.069	1190.4	1.62	-12.9	10.1	-108.1
16	0.853	36540.7	49.58	0.0	-1.3	20.6
PARTS						
1	0.871	40972.1	55.60	0.0	-0.9	25.3
2	1.029	3880.0	5.26	29.9	-2.6	18.0
3	1.027	4016.8	5.45	-29.7	-4.5	22.4
4	1.036	11981.4	16.26	12.6	2.9	-48.7
5	1.035	12847.1	17.43	-11.6	2.5	-47.8
WHOLE BODY						
1	0.937	73697.4	100.00	0.0	0.0	0.0

TABLE # 26 SUBJECT 2 DENSITY 2

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	240609.8	170927.9	200432.8
2	7036978.6	8662186.2	3759718.1
3	446264.3	523625.1	518736.5
4	151143.5	154918.2	42919.1
5	62290.9	69162.1	20820.1
6	10576.8	9760.5	4902.5
7	166572.2	185150.1	58294.2
8	73516.2	80946.9	19782.6
9	8811.8	8701.9	3083.0
10	1457027.9	1432161.6	240327.7
11	549007.8	550204.9	37129.5
12	46760.1	22572.2	35328.5
13	1641330.9	1610345.7	266852.1
14	559935.4	556073.3	44080.0
15	47128.7	21287.7	37770.7
16	14006962.8	15681847.7	4306141.0
PARTS			
1	21785192.1	23356329.0	4540730.5
2	1412809.3	1599546.1	257871.4
3	1420212.5	1618741.0	272078.5
4	11208415.9	11122124.1	398451.2
5	12200054.1	12071583.0	460384.5
WHOLE BODY			
1	135639479.3	147700863.1	16901539.2

TABLE # 27 SUBJECT 2 DENSITY 2

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	2978.7	-2452.0	-39971.4
2	35630.9	18962.6	-563089.9
3	-2647.4	-8941.4	-7070.2
4	-9578.1	-38159.9	18778.2
5	4159.1	-21716.6	-9173.4
6	-361.0	-1073.7	118.3
7	8330.1	58209.6	12332.1
8	-4216.5	23411.4	-11347.9
9	251.5	-612.7	-148.0
10	11729.5	-28389.2	-173693.9
11	2562.8	-17222.4	-4368.8
12	4657.2	-3005.9	-15672.6
13	3395.6	-52239.0	-136388.8
14	-3666.5	31766.5	-35874.9
15	5095.5	-2740.7	-14911.7
16	32783.7	13081.8	-994238.7
PARTS			
1	37005.3	29063.8	-528289.8
2	19269.5	-525927.7	-56015.1
3	-32157.6	532843.3	-98345.9
4	50606.0	-492001.8	-910903.2
5	-24038.2	396358.1	-1047701.1
WHOLE BODY			
1	348045.2	-820535.4	-7449285.4

TABLE # 28 SUBJECT 2 DENSITY 2

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	240768.8	142922.1	228279.7
2	7036210.4	8726864.3	3695808.1
3	445136.9	529327.9	514161.1
4	156570.4	164987.4	27423.1
5	71640.4	70812.1	9820.6
6	10873.8	9666.4	4699.6
7	193048.9	185423.3	31544.2
8	82283.9	82984.6	8977.2
9	9041.1	8542.7	3012.9
10	1464957.4	1449742.8	214817.0
11	547478.3	552351.8	36512.1
12	47629.1	11166.6	45864.9
13	1643474.7	1623876.8	251177.2
14	562437.3	558034.1	39617.3
15	48101.3	11552.1	46533.8
16	14006325.3	15768738.7	4219887.6
PARTS			
1	21784336.8	23372050.9	4525863.8
2	1616749.5	1601471.2	52006.2
3	1633769.2	1621191.9	56071.0
4	11233231.6	11196549.5	299210.2
5	12215917.9	12162796.8	353306.9
WHOLE BODY			
1	135638130.4	148131002.9	16472748.4

TABLE # 29 SUBJECT 2 DENSITY 3

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.071	4494.4	5.48	0.1	1.8	62.5
2	1.023	35479.3	43.29	0.0	-1.6	25.4
3	1.023	8343.9	10.18	0.0	0.6	-8.6
4	1.058	2231.8	2.72	24.0	-3.0	31.0
5	1.099	1281.2	1.56	34.5	-3.0	5.3
6	1.108	547.5	0.67	42.4	0.6	-16.6
7	1.058	2463.5	3.01	-24.1	-5.3	34.0
8	1.099	1274.8	1.56	-36.1	-3.9	8.5
9	1.108	468.3	0.57	-41.1	-0.6	-14.6
10	1.045	7923.6	9.67	11.6	1.7	-31.1
11	1.085	3133.0	3.82	14.5	4.2	-76.6
12	1.085	1189.7	1.45	14.6	9.2	-109.5
13	1.045	8651.5	10.56	-10.7	1.2	-30.4
14	1.085	3272.5	3.99	-13.6	3.5	-77.2
15	1.085	1208.2	1.47	-12.9	10.3	-109.8
16	1.023	43823.1	53.47	0.0	-1.2	18.9
PARTS						
1	1.027	48317.5	58.95	0.0	-0.9	23.0
2	1.077	4060.5	4.95	29.8	-2.5	16.5
3	1.076	4206.6	5.13	-29.6	-4.4	20.9
4	1.059	12246.3	14.94	12.6	3.0	-50.3
5	1.058	13132.2	16.02	-11.6	2.6	-49.4
WHOLE BODY						
1	1.042	81963.0	100.00	0.0	0.0	0.0

TABLE # 30 SUBJECT 2 DENSITY 3

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	244027.4	173355.8	203279.7
2	8439422.7	10388528.2	4509016.2
3	535203.1	627981.7	622118.8
4	159114.4	163088.1	45182.5
5	65073.9	72252.1	21750.3
6	10851.0	10013.6	5029.6
7	175356.7	194914.3	61368.4
8	76800.7	84563.4	20666.5
9	9040.2	8927.5	3162.9
10	1492738.8	1467263.1	246218.0
11	559317.6	560537.1	37826.8
12	47459.9	22910.0	35857.3
13	1681559.0	1649814.4	273392.5
14	570450.3	566515.7	44907.8
15	47834.1	21606.4	38336.0
16	16798499.6	18807182.9	5164339.2
PARTS			
1	24816983.6	26719858.8	5402848.9
2	1469602.9	1663828.1	268555.8
3	1477315.0	1684426.9	283999.6
4	11427889.0	11340041.1	407121.1
5	12439158.2	12308398.8	470280.9
WHOLE BODY			
1	143398545.7	156166272.4	18204152.6

TABLE # 31 SUBJECT 2 DENSITY 3

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	3021.0	-2486.8	-40539.2
2	42732.0	22741.8	-675311.6
3	-3175.0	-10723.4	-8479.3
4	-10083.2	-40172.3	19768.5
5	4344.9	-22686.8	-9583.2
6	-370.4	-1101.5	121.3
7	8769.4	61279.4	12982.4
8	-4404.8	24457.4	-11854.9
9	258.0	-628.5	-151.9
10	12017.0	-29085.0	-177951.1
11	2610.9	-17545.8	-4450.9
12	4726.9	-3050.9	-15907.2
13	3478.8	-53519.4	-139731.6
14	-3735.3	32363.1	-36548.5
15	5171.8	-2781.7	-15134.9
16	39317.4	15688.9	-1192386.9
PARTS			
1	43620.3	32215.3	-711109.3
2	19715.6	-547022.7	-57456.7
3	-33264.3	555044.2	-101737.4
4	51613.7	-501750.7	-928494.9
5	-24508.7	404014.9	-1067308.7
WHOLE BODY			
1	366795.8	-844956.7	-7947522.6

TABLE # 32 SUBJECT 2 DENSITY 3

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	244188.7	144952.1	231522.1
2	8438501.4	10466096.5	4432369.1
3	533851.0	634821.0	616631.5
4	164827.4	173688.3	28869.3
5	74841.1	73975.8	10259.4
6	11155.7	9917.0	4821.5
7	203229.7	195201.9	33207.8
8	85960.2	86692.2	9378.3
9	9275.5	8764.2	3091.0
10	1500862.7	1485275.1	220082.0
11	557759.3	562724.4	37197.8
12	48342.0	11333.8	46551.4
13	1683755.4	1663677.1	257333.4
14	572999.3	568513.3	40361.3
15	48821.3	11725.0	47230.3
16	16797735.0	18911390.9	5060895.8
PARTS			
1	24815997.1	26744589.4	5379104.8
2	1681754.1	1665761.9	54470.8
3	1700096.1	1686919.0	58726.3
4	11453216.0	11415874.8	305960.3
5	12455314.1	12401253.5	361270.2
WHOLE BODY			
1	143396860.7	156630226.5	17741883.5

TABLE # 33 SUBJECT 3 DENSITY 1

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.000	4552.1	5.02	2.1	4.9	61.3
2	1.000	37398.1	41.21	1.2	0.7	25.1
3	1.000	10431.9	11.49	-0.3	0.7	-9.2
4	1.000	2446.9	2.70	25.6	-4.2	35.5
5	1.000	1625.9	1.79	33.9	-4.3	13.4
6	1.000	556.6	0.61	34.1	-2.5	-7.5
7	1.000	2630.9	2.90	-23.2	-3.8	35.7
8	1.000	1408.9	1.55	-36.2	-2.5	13.5
9	1.000	519.5	0.57	-42.6	-0.3	-5.7
10	1.000	10007.2	11.03	10.5	-0.7	-31.0
11	1.000	3705.7	4.08	13.3	-2.8	-72.8
12	1.000	918.3	1.01	12.9	2.2	-103.1
13	1.000	9923.5	10.93	-13.3	-0.3	-30.3
14	1.000	3677.6	4.05	-18.6	-1.9	-71.7
15	1.000	955.9	1.05	-20.1	2.3	-102.2
16	1.000	47830.1	52.70	0.9	0.7	17.6
PARTS						
1	1.000	52382.1	57.72	1.0	1.1	21.4
2	1.000	4629.4	5.10	29.5	-4.0	22.6
3	1.000	4559.4	5.02	-29.4	-3.0	24.1
4	1.000	14631.2	16.12	11.4	-1.0	-46.1
5	1.000	14557.0	16.04	-15.1	-0.6	-45.5
WHOLE BODY						
1	1.000	90759.1	100.00	0.0	0.0	0.0

TABLE # 34 SUBJECT 3 DENSITY 1

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	261870.2	197589.1	206999.4
2	9042870.6	10856715.4	4877247.8
3	807742.1	953553.6	909553.3
4	134737.8	145269.9	64351.7
5	86907.1	83086.1	24420.5
6	9373.6	8654.6	5963.5
7	161753.2	187160.6	74396.4
8	54936.3	65907.7	30324.7
9	10086.3	8156.5	4903.7
10	1710675.2	1701080.0	395407.0
11	470448.0	472087.9	65684.6
12	32823.1	12943.4	27458.1
13	1683084.3	1683621.5	376668.8
14	429795.1	435943.1	68852.1
15	32445.0	17562.5	23579.8
16	19470383.1	21449094.0	5805884.4
PARTS			
1	27734468.3	29580502.9	6093947.5
2	1280630.3	1365008.1	176183.3
3	1206388.6	1491387.0	371772.4
4	10140101.9	10113497.1	533215.3
5	10059275.4	10138067.0	586427.9
WHOLE BODY			
1	141006135.1	156305148.1	21186806.4

TABLE # 35 SUBJECT 3 DENSITY 1

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	241.7	1871.1	-43685.7
2	-69424.2	193185.1	-527075.3
3	-4758.2	-11415.4	22883.8
4	-14714.0	-42300.1	21491.4
5	3218.0	-10562.2	-17816.1
6	-642.8	1502.2	1204.0
7	8317.3	63167.6	8456.6
8	-6147.1	22415.6	-9573.1
9	227.3	-614.5	521.0
10	-9231.4	104881.0	-32291.6
11	51.6	-23777.8	9771.8
12	-1507.2	-68.5	-10161.3
13	445.9	-1824.9	-27050.5
14	-2512.1	39840.8	938.5
15	671.0	433.0	-11460.2
16	-73658.6	610067.6	-492426.6
PARTS			
1	-51660.2	836025.0	233573.6
2	-8108.0	-316199.8	-23520.2
3	-33650.6	579685.5	-73895.1
4	-21511.8	-316015.1	23519.5
5	5950.0	923413.4	-32300.3
WHOLE BODY			
1	-249506.9	4931903.1	1644373.2

TABLE # 36 SUBJECT 3 DENSITY 1

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	262034.0	158344.8	246079.8
2	9050730.2	10904296.3	4821807.2
3	806109.7	963297.4	901441.8
4	148641.9	157386.1	38331.3
5	88757.5	87982.3	17673.7
6	10548.1	8293.7	5150.0
7	196297.2	186614.9	40398.2
8	67893.3	68732.9	14542.6
9	10199.2	8186.8	4760.5
10	1721269.4	1699620.9	386271.9
11	471413.3	472747.8	64059.5
12	33545.8	7645.8	32032.9
13	1682951.5	1684316.5	376106.6
14	432291.2	437793.4	64505.6
15	33186.6	8719.6	31681.1
16	19496211.7	21466082.9	5763066.8
PARTS			
1	27764696.5	29584800.9	6059421.2
2	1351162.9	1378930.2	91728.5
3	1504918.2	1494448.2	70181.6
4	10159780.9	10104263.2	522770.1
5	10153698.3	10132922.5	497149.5
WHOLE BODY			
1	141202422.0	156331426.8	20964198.8

TABLE # 37 SUBJECT 3 DENSITY 2

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.056	4807.0	5.64	2.2	5.0	63.3
2	0.853	31900.6	37.42	1.3	0.8	27.1
3	0.853	8898.4	10.44	-0.3	0.7	-7.3
4	1.005	2459.1	2.88	25.7	-4.2	37.5
5	1.052	1710.5	2.01	34.0	-4.2	15.4
6	1.080	601.1	0.71	34.2	-2.4	-5.5
7	1.005	2644.1	3.10	-23.1	-3.7	37.7
8	1.052	1482.2	1.74	-36.1	-2.5	15.4
9	1.080	561.1	0.66	-42.5	-0.2	-3.7
10	1.020	10207.4	11.97	10.6	-0.6	-29.1
11	1.065	3946.5	4.63	13.4	-2.7	-70.9
12	1.069	981.7	1.15	13.0	2.2	-101.2
13	1.020	10122.0	11.87	-13.2	-0.3	-28.4
14	1.065	3916.6	4.59	-18.5	-1.8	-69.8
15	1.069	1021.9	1.20	-20.0	2.4	-100.3
16	0.853	40799.0	47.85	0.9	0.8	19.6
PARTS						
1	0.871	45606.0	53.49	1.1	1.2	24.2
2	1.031	4770.7	5.60	29.7	-4.0	24.1
3	1.028	4687.3	5.50	-29.5	-2.9	25.7
4	1.034	15135.6	17.75	11.5	-1.0	-44.7
5	1.035	15060.4	17.66	-15.0	-0.5	-44.0
WHOLE BODY						
1	0.939	85260.1	100.00	0.0	0.0	0.0

TABLE # 38 SUBJECT 3 DENSITY 2

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	276534.9	208654.0	218591.3
2	7713568.5	9260778.1	4160292.3
3	689004.0	813381.2	775848.9
4	135411.4	145996.1	64673.4
5	91426.2	87406.5	25690.3
6	10123.5	9346.9	6440.6
7	162561.9	188096.2	74768.4
8	57793.0	69334.8	31901.5
9	10893.2	8809.0	5296.0
10	1744887.8	1735100.8	403315.0
11	501027.0	502773.4	69954.1
12	35087.9	13836.5	29352.6
13	1716745.2	1717293.1	384202.0
14	457731.6	464279.2	73327.4
15	34683.7	18774.3	25206.8
16	16608236.8	18296077.1	4952419.3
PARTS			
1	25163887.6	26713085.2	5254879.3
2	1335269.3	1421980.7	181014.3
3	1257439.4	1553514.9	385302.6
4	10628190.4	10599900.4	549846.3
5	10543560.6	10625994.1	606314.5
WHOLE BODY			
1	141065869.8	156609609.5	20935360.4

TABLE # 39 SUBJECT 3 DENSITY 2

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	255.3	1975.8	-46132.0
2	-59218.8	164786.9	-449595.2
3	-4058.8	-9737.3	19519.9
4	-14787.6	-42511.6	21598.8
5	3385.4	-11111.4	-18742.5
6	-694.2	1622.4	1300.3
7	8358.9	63483.4	8498.9
8	-6466.8	23581.2	-10070.9
9	245.5	-663.6	562.6
10	-9416.0	106978.6	-32937.4
11	55.0	-25323.3	10406.9
12	-1611.2	-73.2	-10862.4
13	454.8	-1861.4	-27591.5
14	-2675.4	42430.4	999.5
15	717.3	462.9	-12250.9
16	-62830.8	520387.7	-420039.9
PARTS			
1	-40066.0	754203.9	330147.5
2	-7837.2	-326695.8	-26145.4
3	-35668.1	603256.1	-78112.0
4	-22346.6	-335634.7	23361.5
5	6083.4	972060.1	-35381.4
WHOLE BODY			
1	-252549.3	4910627.6	1739045.4

TABLE # 40 SUBJECT 3 DENSITY 2

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	276707.8	167212.1	259860.2
2	7720272.8	9301364.6	4113001.5
3	687611.6	821692.6	768929.8
4	149385.0	158172.9	38522.9
5	93372.9	92557.3	18592.8
6	11391.9	8957.2	5562.0
7	197278.5	187547.8	40600.1
8	71423.7	72306.9	15298.8
9	11015.1	8841.8	5141.4
10	1755693.9	1733612.5	393997.2
11	502054.9	503476.2	68223.4
12	35860.5	8173.3	34243.2
13	1716609.7	1718002.0	383628.5
14	460390.0	466249.8	68698.5
15	35476.5	9321.2	33867.0
16	16630268.6	18310568.7	4915895.9
PARTS			
1	25190612.7	26719908.4	5221331.1
2	1407609.0	1436101.0	94554.3
3	1567343.8	1556871.0	72042.1
4	10648858.9	10590454.7	538623.5
5	10643047.4	10620819.9	512001.9
WHOLE BODY			
1	141259473.2	156638360.6	20713005.9

TABLE # 41 SUBJECT 3 DENSITY 3

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.071	4875.3	5.15	2.1	5.0	61.7
2	1.023	38258.3	40.45	1.2	0.7	25.5
3	1.023	10671.8	11.28	-0.3	0.7	-8.8
4	1.058	2588.8	2.74	25.6	-4.2	35.9
5	1.099	1786.9	1.89	33.9	-4.3	13.8
6	1.108	616.7	0.65	34.1	-2.5	-7.1
7	1.058	2783.5	2.94	-23.2	-3.8	36.1
8	1.099	1548.4	1.64	-36.2	-2.5	13.9
9	1.108	575.6	0.61	-42.6	-0.3	-5.3
10	1.045	10457.5	11.06	10.5	-0.7	-30.7
11	1.085	4020.6	4.25	13.3	-2.7	-72.4
12	1.085	996.4	1.05	12.9	2.2	-102.7
13	1.045	10370.1	10.96	-13.2	-0.3	-29.9
14	1.085	3990.1	4.22	-18.6	-1.9	-71.4
15	1.085	1037.2	1.10	-20.1	2.4	-101.9
16	1.023	48930.1	51.74	0.9	0.7	18.0
PARTS						
1	1.027	53805.4	56.89	1.0	1.1	22.0
2	1.078	4992.4	5.28	29.6	-4.0	22.7
3	1.076	4907.5	5.19	-29.6	-3.0	24.2
4	1.058	15474.5	16.36	11.4	-1.0	-46.2
5	1.058	15397.4	16.28	-15.1	-0.6	-45.5
WHOLE BODY						
1	1.042	94577.3	100.00	0.0	0.0	0.0

TABLE # 42 SUBJECT 3 DENSITY 3

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	280462.7	211617.7	221696.2
2	9250854.5	11106417.3	4989423.3
3	826319.9	975485.1	930472.8
4	142552.5	153695.5	68084.1
5	95510.9	91311.6	26838.1
6	10386.0	9589.3	6607.6
7	171134.9	198015.8	78711.4
8	60375.0	72432.6	33326.8
9	11175.7	9037.4	5433.3
10	1787654.0	1777627.1	413200.0
11	510435.7	512215.0	71267.8
12	35613.0	14043.6	29792.0
13	1758821.7	1759383.0	393618.6
14	466327.3	472997.8	74704.4
15	35202.8	19055.3	25584.0
16	19918197.1	21942417.8	5939418.4
PARTS			
1	28734222.4	30616644.3	6247581.1
2	1389337.2	1480146.0	189573.3
3	1308546.9	1617258.4	402059.2
4	10839768.3	10811039.3	562376.3
5	10753025.7	10837201.1	619876.1
WHOLE BODY			
1	149542891.2	165914670.7	22476299.5

TABLE # 43 SUBJECT 3 DENSITY 3

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	258.9	2003.9	-46787.3
2	-71020.9	197628.3	-539197.9
3	-4867.7	-11677.9	23410.1
4	-15567.4	-44753.5	22737.9
5	3536.6	-11607.9	-19579.9
6	-712.2	1664.5	1334.0
7	8799.7	66831.3	8947.1
8	-6755.7	24634.7	-10520.9
9	251.8	-680.8	577.2
10	-9646.8	109600.5	-33744.7
11	56.0	-25798.9	10602.3
12	-1635.3	-74.3	-11025.0
13	466.0	-1907.0	-28267.7
14	-2725.6	43227.2	1018.2
15	728.1	469.8	-12434.3
16	-75352.8	624099.0	-503752.3
PARTS			
1	-51887.0	865124.6	270445.8
2	-8355.2	-341232.6	-26697.9
3	-36942.6	628333.0	-80916.0
4	-22850.0	-341803.4	24656.1
5	6278.1	990876.8	-35316.2
WHOLE BODY			
1	-268726.6	5225151.3	1765456.4

TABLE # 44 SUBJECT 3 DENSITY 3

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	280638.2	169587.2	263551.3
2	9258894.9	11155092.6	4932707.6
3	824650.1	985453.0	922174.7
4	157263.1	166514.5	40554.5
5	97544.5	96692.6	19423.4
6	11687.3	9189.4	5706.2
7	207682.4	197438.5	42741.3
8	74614.7	75537.4	15982.3
9	11300.7	9071.0	5274.7
10	1798725.0	1776102.3	403653.8
11	511483.0	512930.9	69504.5
12	36397.2	8295.6	34755.7
13	1758682.8	1760109.3	393031.1
14	469035.6	475005.4	69988.5
15	36007.4	9460.7	34373.9
16	19944619.8	21959797.5	5895616.0
PARTS			
1	28765368.7	30621681.2	6211397.8
2	1465165.2	1494985.3	98905.9
3	1631730.3	1620699.4	75434.9
4	10860865.9	10801359.7	550958.4
5	10854449.7	10831877.2	523776.0
WHOLE BODY			
1	149750215.1	165943237.6	22240408.7

TABLE # 45 SUBJECT 4 DENSITY 1

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.000	3235.1	5.85	-4.7	10.1	54.4
2	1.000	24572.9	44.46	-1.0	-3.8	18.4
3	1.000	6179.8	11.18	1.3	-10.4	-14.4
4	1.000	1738.8	3.15	19.0	-4.1	25.7
5	1.000	828.0	1.50	25.8	3.1	10.1
6	1.000	338.0	0.61	22.1	22.2	2.0
7	1.000	1730.6	3.13	-21.1	-3.0	23.7
8	1.000	875.0	1.58	-23.5	6.3	5.9
9	1.000	373.5	0.68	-18.2	26.1	-0.5
10	1.000	4394.2	7.95	12.7	-0.4	-26.6
11	1.000	2279.7	4.12	14.5	17.5	-57.8
12	1.000	768.6	1.39	14.5	16.6	-87.0
13	1.000	5204.3	9.42	-8.4	0.7	-26.9
14	1.000	2037.4	3.69	-6.9	21.5	-59.1
15	1.000	712.1	1.29	-10.3	17.9	-87.5
16	1.000	30752.6	55.64	-0.6	-5.1	11.8
PARTS						
1	1.000	33987.7	61.50	-1.0	-3.7	15.8
2	1.000	2904.8	5.26	21.3	1.0	18.5
3	1.000	2979.0	5.39	-21.4	3.4	15.4
4	1.000	7442.5	13.47	13.4	6.8	-42.4
5	1.000	7953.8	14.39	-8.2	7.6	-40.6
WHOLE BODY						
1	1.000	55267.9	100.00	0.0	0.0	0.0

TABLE # 46 SUBJECT 4 DENSITY 1

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	143603.2	120792.7	111300.0
2	5896701.4	6569792.8	2301031.6
3	308978.5	425848.6	413362.9
4	128598.1	141332.5	45660.3
5	45274.4	8287.5	42260.2
6	6664.9	5006.0	3988.8
7	145641.7	148116.6	25498.7
8	49615.4	9120.3	45468.3
9	6413.3	5819.9	5625.0
10	737589.7	254968.2	571204.5
11	344651.2	331668.3	37213.0
12	25665.0	11642.7	21961.1
13	1050785.4	356049.7	839560.8
14	314029.0	288724.1	45738.4
15	21630.2	12977.2	19485.8
16	11739850.9	12338045.5	2958314.1
PARTS			
1	17872308.0	17820739.2	3797334.5
2	622179.4	422245.2	319538.2
3	765574.5	462848.5	356443.9
4	4836818.7	3770218.7	1198740.8
5	5347096.7	3905068.7	1631987.8
WHOLE BODY			
1	67452752.5	67679635.4	13179780.5

TABLE # 47 SUBJECT 4 DENSITY 1

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	4757.5	-5496.3	-23103.1
2	-82150.0	-197486.8	956019.6
3	-693.1	-4023.5	-10954.0
4	-11986.1	-47500.3	27314.8
5	-3412.2	926.0	-10414.4
6	-1216.4	356.4	-1664.0
7	3430.2	29266.5	16441.6
8	1448.9	-593.3	-11720.8
9	2096.0	-716.1	-1372.0
10	33446.0	71.5	-279024.2
11	2704.9	9028.0	66313.8
12	4421.0	-3189.8	-8547.3
13	86873.1	-70743.4	-407412.6
14	6730.6	21814.0	83312.3
15	-5516.9	4456.9	-7958.0
16	-158212.6	-573841.1	2021228.3
PARTS			
1	-338189.2	-1096651.6	3894881.8
2	17375.3	-111434.4	-181283.3
3	25241.1	31084.6	-247724.6
4	97153.0	-117456.2	-1432003.3
5	116528.1	-36182.4	-1694465.1
WHOLE BODY			
1	79409.4	-3284060.6	-6016158.0

TABLE # 48 · SUBJECT 4 DENSITY 1

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	144624.5	139623.0	91448.4
2	5906550.7	6775874.2	2085101.0
3	308823.0	432269.6	407097.3
4	150264.6	148403.0	16923.3
5	45588.3	5038.4	45195.4
6	7392.6	5764.4	2502.7
7	152447.6	150204.7	16604.6
8	49703.1	5613.5	48887.4
9	8293.7	3095.0	6469.5
10	753412.6	91085.5	719264.3
11	344522.8	346316.0	22693.7
12	27555.4	5370.6	26342.8
13	1048895.2	111066.1	1086434.6
14	315791.1	314544.7	18155.7
15	24113.4	4685.1	25294.8
16	11776498.8	12756606.3	2503105.3
PARTS			
1	18833004.6	17955826.1	2701551.0
2	668544.4	534677.3	160741.1
3	778922.8	649785.1	156159.1
4	4845676.6	4405173.4	554928.1
5	5362026.0	4795556.3	726570.9
WHOLE BODY			
1	67550233.0	68433739.8	12329096.0

TABLE # 49 SUBJECT 4 DENSITY 2

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.056	3416.3	6.61	-4.8	9.5	55.8
2	0.853	20960.6	40.57	-1.1	-4.4	19.8
3	0.853	5271.4	10.20	1.2	-11.1	-13.0
4	1.005	1747.5	3.38	18.9	-4.7	27.1
5	1.052	871.0	1.69	25.8	2.4	11.5
6	1.080	365.1	0.71	22.0	21.6	3.5
7	1.005	1739.2	3.37	-21.1	-3.7	25.1
8	1.052	920.5	1.78	-23.6	5.6	7.3
9	1.080	403.3	0.78	-18.3	25.5	0.9
10	1.020	4482.1	8.68	12.6	-1.1	-25.2
11	1.065	2427.9	4.70	14.4	16.8	-56.3
12	1.C69	821.6	1.59	14.4	15.9	-85.6
13	1.020	5308.4	10.27	-8.4	0.0	-25.5
14	1.065	2169.8	4.20	-6.9	20.9	-57.7
15	1.069	761.2	1.47	-10.4	17.2	-86.1
16	0.853	26232.0	50.77	-0.6	-5.8	13.2
PARTS						
1	0.872	29648.3	57.38	-1.1	-4.0	18.1
2	1.027	2983.6	5.77	21.3	0.6	19.7
3	1.028	3063.1	5.93	-21.5	3.0	16.6
4	1.039	7731.6	14.96	13.4	6.4	-41.4
5	1.036	8239.5	15.95	-8.2	7.1	-39.6
WHOLE BODY						
1	0.935	51666.0	100.00	0.0	0.0	0.0

TABLE # 50 SUBJECT 4 DENSITY 2

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	151644.9	127557.0	117532.8
2	5029886.2	5604033.2	1962779.9
3	263558.6	363248.8	352598.6
4	129241.0	142039.1	45888.5
5	47628.7	8718.4	44457.7
6	7198.1	5406.5	4307.9
7	146369.8	148857.1	25626.2
8	52195.3	9594.6	47832.6
9	6926.4	6285.5	6074.9
10	752341.1	260067.5	582628.3
11	367053.4	353226.6	39631.9
12	27435.8	12446.0	23476.4
13	1071800.6	363170.5	856351.6
14	334440.8	307491.0	48711.4
15	23122.7	13872.7	20830.3
16	10014092.5	10524352.6	2523441.9
PARTS			
1	16349880.8	16188655.8	3392425.2
2	648806.2	435386.3	335667.6
3	797499.8	477091.5	375943.8
4	5063258.9	3959233.2	1240592.4
5	5597481.8	4104072.3	1689248.0
WHOLE BODY			
1	67571635.7	67786439.8	13006570.5

TABLE # 51 SUBJECT 4 DENSITY 2

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	5024.0	-5804.1	-24396.9
2	-70074.0	-168456.2	815484.7
3	-591.2	-3432.0	-9343.7
4	-12046.0	-47737.7	27451.3
5	-3589.6	974.2	-10955.9
6	-1313.7	384.9	-1797.1
7	3447.4	29412.8	16523.8
8	1524.2	-624.2	-12330.3
9	2263.7	-773.4	-1481.7
10	34114.9	72.9	-284604.5
11	2880.8	9614.8	70624.1
12	4726.1	-3409.9	-9137.0
13	88610.5	-72158.3	-415560.7
14	7168.0	23231.9	88727.6
15	-5897.6	4764.5	-8507.1
16	-134955.3	-489486.5	1724107.7
PARTS			
1	-320689.5	-1029473.8	3658318.4
2	17953.9	-113689.7	-192184.0
3	27401.6	30534.0	-260702.7
4	100941.4	-122914.7	-1490689.2
5	119759.4	-34352.7	-1764979.7
WHOLE BODY			
1	97726.0	-3302425.8	-6372303.7

TABLE # 52 SUBJECT 4 DENSITY 2

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	152723.4	147441.9	96569.5
2	5038287.6	5779820.6	1778591.1
3	263426.0	368726.0	347254.0
4	151015.8	149144.9	17007.9
5	47958.8	5300.4	47545.5
6	7984.0	6225.5	2702.9
7	153209.8	150955.6	16687.6
8	52287.6	5905.4	51429.5
9	8957.1	3342.6	6987.1
10	768480.4	92907.2	733649.2
11	366916.6	368826.4	24168.7
12	29456.7	5741.2	28160.4
13	1069872.6	113287.4	1108162.8
14	336317.4	334990.0	19335.9
15	25777.2	5008.3	27040.1
16	10045353.2	10881384.9	2135148.8
PARTS			
1	16429881.7	17163520.4	2337559.7
2	696155.1	558119.9	165585.0
3	811354.9	678284.6	160895.6
4	5072493.2	4613312.5	577278.8
5	5612999.1	5021137.3	756665.6
WHOLE BODY			
1	67674603.9	68610268.5	12079773.5

TABLE # 53 SUBJECT 4 DENSITY 3

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.071	3464.8	6.02	-4.7	9.9	54.7
2	1.023	25138.0	43.66	-1.1	-3.9	18.7
3	1.023	6321.9	10.98	1.2	-10.6	-14.1
4	1.058	1839.6	3.20	18.9	-4.2	26.0
5	1.099	909.9	1.58	25.8	2.9	10.4
6	1.108	374.5	0.65	22.0	22.1	2.3
7	1.058	1830.9	3.18	-21.1	-3.2	24.0
8	1.099	961.6	1.67	-23.5	6.1	6.2
9	1.108	413.8	0.72	-18.2	26.0	-0.2
10	1.045	4592.0	7.98	12.7	-0.6	-26.3
11	1.085	2473.4	4.30	14.4	17.3	-57.5
12	1.085	833.9	1.45	14.4	16.4	-86.7
13	1.045	5438.5	9.45	-8.4	0.5	-26.6
14	1.085	2210.6	3.84	-6.9	21.4	-58.8
15	1.085	772.6	1.34	-10.3	17.7	-87.2
16	1.023	31459.9	54.64	-0.6	-5.3	12.1
PARTS						
1	1.028	34924.7	60.66	-1.0	-3.8	16.3
2	1.076	3124.1	5.43	21.3	1.0	18.6
3	1.076	3206.4	5.57	-21.4	3.4	15.5
4	1.061	7899.3	13.72	13.4	6.8	-42.4
5	1.059	8421.7	14.63	-8.2	7.6	-40.6
WHOLE BODY						
1	1.042	57576.3	100.00	0.0	0.0	0.0

TABLE # 54 SUBJECT 4 DENSITY 3

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	153798.9	129368.9	119202.2
2	6032324.1	6720896.5	2353954.8
3	316084.9	435643.0	422870.2
4	136056.8	149529.8	48308.6
5	49756.6	9107.9	46444.0
6	7384.8	5546.7	4419.6
7	154088.9	156707.3	26977.6
8	54527.3	10023.3	49969.7
9	7106.0	6448.4	6232.4
10	770780.6	266441.6	596908.2
11	373946.2	359859.8	40376.1
12	27846.4	12632.3	23827.8
13	1098069.9	372071.6	877340.3
14	340721.2	313265.3	49626.2
15	23468.8	14080.3	21142.1
16	12009865.1	12621818.0	3026354.6
PARTS			
1	18549202.8	18468245.0	3921479.4
2	675030.5	454923.9	348394.6
3	830093.9	498565.3	389515.4
4	5164252.2	4035617.0	1268273.7
5	5709579.6	4182867.3	1727006.6
WHOLE BODY			
1	71597778.2	71838627.6	13950064.2

TABLE # 55 SUBJECT 4 DENSITY 3

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	5095.3	-5886.6	-24743.4
2	-84039.5	-202028.9	978007.8
3	-709.0	-4116.0	-11205.9
4	-12681.2	-50255.3	28899.0
5	-3750.0	1017.7	-11445.4
6	-1347.7	394.9	-1843.7
7	3629.2	30963.9	17395.2
8	1592.3	-652.0	-12881.2
9	2322.4	-793.4	-1520.1
10	34951.0	74.7	-291580.0
11	2934.9	9795.3	71950.4
12	4796.8	-3460.9	-9273.8
13	90782.3	-73926.8	-425745.8
14	7302.6	23668.2	90393.8
15	-5985.8	4835.8	-8634.4
16	-161851.4	-587039.4	2067716.1
PARTS			
1	-353726.6	-1144505.5	4065365.2
2	18757.5	-119330.4	-198726.0
3	28027.1	32574.6	-270301.3
4	103125.5	-125376.4	-1522029.5
5	122648.6	-35813.6	-1802120.9
WHOLE BODY			
1	89206.1	-3484838.5	-6522628.4

TABLE # 56 SUBJECT 4 DENSITY 3

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	154892.7	149536.1	97941.1
2	6042399.9	6931717.7	2133057.8
3	315925.8	442211.7	416460.5
4	158979.9	157010.3	17904.9
5	50101.5	5537.2	49669.8
6	8191.0	6386.9	2773.0
7	161289.6	158916.6	17567.7
8	54623.7	6169.2	53727.3
9	9189.4	3429.2	7168.2
10	787315.5	95184.3	751630.5
11	373806.9	375752.6	24622.6
12	29897.6	5827.1	28581.9
13	1096094.6	116064.0	1135323.2
14	342633.1	341280.7	19699.0
15	26163.0	5083.3	27444.8
16	12047355.9	13050005.6	2560676.2
PARTS			
1	19530517.0	18636742.8	2771667.4
2	724744.0	580461.3	173143.7
3	844533.2	705431.2	168210.1
4	5173681.0	4704831.6	589630.3
5	5725432.7	5121388.5	772632.3
WHOLE BODY			
1	71701974.6	72666218.7	13018276.7

TABLE # 57 SUBJECT 5 DENSITY 1

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.000	4154.0	6.79	0.5	4.2	53.1
2	1.000	23956.5	39.17	0.1	-4.9	19.4
3	1.000	6029.6	9.86	-0.3	-10.9	-10.2
4	1.000	1967.4	3.22	22.6	-4.3	22.8
5	1.000	1032.6	1.69	26.4	5.8	7.9
6	1.000	346.5	0.57	19.0	24.9	0.4
7	1.000	1724.8	2.82	-23.0	-4.8	22.5
8	1.000	979.7	1.60	-28.7	3.1	8.5
9	1.000	378.6	0.62	-26.1	24.0	3.5
10	1.000	7035.0	11.50	11.9	1.9	-22.4
11	1.000	2716.2	4.44	13.4	19.8	-52.8
12	1.000	908.0	1.48	9.7	15.9	-82.5
13	1.000	6567.6	10.74	-12.1	1.5	-23.0
14	1.000	2603.9	4.26	-14.7	19.7	-52.1
15	1.000	762.9	1.25	-16.6	18.0	-82.4
16	1.000	29986.1	49.03	-0.0	-6.1	13.4
PARTS						
1	1.000	34140.1	55.82	0.0	-4.9	18.3
2	1.000	3346.5	5.47	23.4	1.8	15.9
3	1.000	3083.2	5.04	-25.2	1.3	15.7
4	1.000	10659.3	17.43	12.1	7.7	-35.3
5	1.000	9934.4	16.24	-13.2	7.5	-35.2
WHOLE BODY						
1	1.000	61163.5	100.00	0.0	0.0	0.0

TABLE # 58 SUBJECT 5 DENSITY 1

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	218602.0	183773.9	155138.6
2	4441126.7	5703828.4	2575366.6
3	280452.8	452249.4	433356.3
4	117059.7	123260.8	38420.4
5	55962.0	11806.4	53120.3
6	4748.3	6064.2	3971.2
7	98483.5	103186.5	33294.3
8	51055.2	7624.9	50744.2
9	5199.4	4642.7	5264.6
10	1293526.1	416966.7	1118787.2
11	372073.6	357881.0	66256.3
12	32628.9	23960.5	16212.6
13	1045579.6	361741.9	879233.7
14	389082.1	381626.4	44063.0
15	25153.6	16389.5	14326.2
16	9120323.0	10383685.9	3181308.8
PARTS			
1	15470876.9	16306783.2	3730813.9
2	695655.5	400405.1	387858.7
3	603502.5	322535.6	372426.0
4	6420949.4	4836540.2	1906311.7
5	5588883.1	4207063.7	1663613.1
WHOLE BODY			
1	69354794.4	71696014.1	17157176.9

TABLE # 59 SUBJECT 5 DENSITY 1

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	2467.3	1137.0	-29384.1
2	25028.0	-8936.8	523505.6
3	1549.6	16531.6	-10064.8
4	-5857.3	-32149.6	13816.0
5	-7614.2	1954.5	-11471.8
6	-1146.5	1332.8	-707.5
7	7819.8	26104.8	19176.5
8	-4066.4	16.8	-4112.4
9	1498.2	-491.8	-1419.0
10	98653.1	-5480.9	-432771.8
11	16028.9	47640.7	91079.9
12	1109.7	-1701.6	-11652.2
13	-14938.9	-24183.1	-356362.9
14	4499.1	28679.1	67370.4
15	-122.8	525.6	-9268.5
16	37741.5	62960.0	1365752.2
PARTS			
1	58700.2	134711.9	2839055.0
2	-28241.7	-40062.8	-238602.9
3	-31542.9	80088.4	-175358.5
4	148263.8	64306.4	-1806723.7
5	-127230.7	279027.1	-1692234.0
WHOLE BODY			
1	60978.9	620263.5	-9483854.2

TABLE # 60 SUBJECT 5 DENSITY 1

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	219033.4	201713.0	136768.1
2	4440631.8	5789612.1	2490077.8
3	278684.6	456984.2	430389.7
4	128761.9	125305.7	24673.4
5	57238.9	7558.0	56091.7
6	5535.5	6729.8	2518.5
7	106916.6	109003.8	19043.9
8	51672.5	6865.0	50886.8
9	6755.0	2626.9	5724.8
10	1352340.5	203043.0	1273896.5
11	384928.1	378565.2	32717.6
12	32813.9	32345.6	7642.4
13	1082575.6	180090.8	1023888.7
14	391132.6	394861.1	28777.9
15	25278.1	24570.8	6020.4
16	9120647.2	10634408.5	2930262.0
PARTS			
1	15471973.9	16918583.1	3117917.0
2	721870.0	606753.9	155295.6
3	631037.7	157180.7	510245.7
4	6455375.4	5663120.9	1045305.0
5	5608702.2	5051951.7	798906.0
WHOLE BODY			
1	69354852.9	73304897.6	15548313.2

TABLE # 61 SUBJECT 5 DENSITY 2

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.056	4386.7	7.58	0.5	3.6	54.5
2	0.853	20434.9	35.29	0.1	-5.6	20.8
3	0.853	5143.2	8.88	-0.3	-11.6	-8.8
4	1.005	1977.2	3.41	22.6	-5.0	24.1
5	1.052	1086.3	1.88	26.4	5.1	9.3
6	1.080	374.2	0.65	19.0	24.2	1.8
7	1.005	1733.4	2.99	-23.0	-5.5	23.9
8	1.052	1030.7	1.78	-28.7	2.5	9.9
9	1.080	408.9	0.71	-26.1	23.3	4.9
10	1.020	7175.7	12.39	11.9	1.2	-21.0
11	1.065	2892.8	5.00	13.4	19.1	-51.4
12	1.069	970.7	1.68	9.7	15.3	-81.1
13	1.020	6698.9	11.57	-12.1	0.8	-21.6
14	1.065	2773.2	4.79	-14.7	19.0	-50.8
15	1.069	815.6	1.41	-16.6	17.3	-81.0
16	0.853	25578.1	44.17	-0.0	-6.8	14.8
PARTS						
1	0.878	29964.8	51.75	0.1	-5.3	20.6
2	1.027	3437.8	5.94	23.4	1.4	17.0
3	1.029	3173.0	5.48	-25.3	0.8	16.9
4	1.036	11039.2	19.07	12.1	7.2	-34.3
5	1.036	10287.7	17.77	-13.2	7.0	-34.2
WHOLE BODY						
1	0.947	57902.4	100.00	0.0	0.0	0.0

TABLE # 62 SUBJECT 5 DENSITY 2

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	230843.7	194065.2	163826.3
2	3788281.0	4865365.5	2196787.7
3	239226.2	385768.8	369652.9
4	117644.9	123877.0	38612.5
5	58872.0	12420.3	55882.5
6	5128.2	6549.3	4288.9
7	98975.8	103702.4	33460.7
8	53710.1	8021.3	53382.8
9	5615.4	5014.1	5685.8
10	1319395.9	425305.8	1141162.4
11	396258.3	381143.1	70562.9
12	34880.3	25613.7	17331.2
13	1066490.6	368976.6	896817.9
14	414372.3	406431.9	46927.1
15	26889.2	17520.4	15314.7
16	7779635.6	8857284.1	2713656.4
PARTS			
1	14303589.9	14941512.4	3282213.8
2	725665.9	413465.7	407939.0
3	630445.9	331907.5	392315.0
4	6723715.3	5086279.5	1969409.9
5	5855932.4	4425449.7	1721265.9
WHOLE BODY			
1	69794009.2	72139829.4	17018463.9

TABLE # 63 SUBJECT 5 DENSITY 2

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	2605.5	1200.6	-31029.6
2	21348.9	-7623.1	446550.2
3	1321.8	14101.4	-8585.3
4	-5886.5	-32310.3	13885.1
5	-8010.2	2056.1	-12068.4
6	-1238.3	1439.4	-764.0
7	7858.9	26235.3	19272.4
8	-4277.9	17.7	-4326.2
9	1618.0	-531.1	-1532.5
10	100626.1	-5590.5	-441427.0
11	17070.8	50737.4	97000.1
12	1186.3	-1819.0	-12456.2
13	-15237.7	-24666.7	-363490.0
14	4791.5	30543.2	71749.4
15	-131.2	561.9	-9908.0
16	32193.5	53704.9	1164986.7
PARTS			
1	53776.4	127376.4	2676137.2
2	-30898.8	-39436.4	-251028.3
3	-32597.2	81880.9	-184872.9
4	153038.2	69934.2	-1881994.8
5	-133076.7	294972.9	-1765365.2
WHOLE BODY			
1	48573.5	645013.0	-9748203.8

TABLE # 64 SUBJECT 5 DENSITY 2

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	231299.2	213008.8	144427.1
2	3787858.8	4938539.0	2124036.3
3	237717.9	389807.5	367122.4
4	129405.6	125932.1	24796.8
5	60215.3	7951.0	59008.4
6	5978.3	7268.2	2719.9
7	107451.1	109548.7	19139.1
8	54359.4	7221.9	53532.9
9	7295.4	2837.1	6182.8
10	1379386.6	207103.8	1299373.8
11	409948.3	403171.8	34844.2
12	35078.1	34577.5	8169.7
13	1104226.6	183692.6	1044366.0
14	416556.1	420526.9	30648.4
15	27022.3	26266.2	6435.8
16	7779912.2	9071150.5	2499513.4
PARTS			
1	14304656.1	15526944.0	2695716.1
2	752847.2	634635.5	159587.9
3	658590.3	161729.9	534348.3
4	6759626.3	5935420.1	1084358.1
5	5876955.8	5296801.1	828891.2
WHOLE BODY			
1	69795106.9	73819142.2	15338053.4

TABLE # 65 SUBJECT 5 DENSITY 3

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.071	4449.0	6.97	0.5	4.1	53.4
2	1.023	24507.5	38.39	0.1	-5.1	19.7
3	1.023	6168.3	9.66	-0.3	-11.1	-9.9
4	1.058	2081.5	3.26	22.6	-4.5	23.0
5	1.099	1134.9	1.78	26.4	5.6	8.2
6	1.108	383.9	0.60	19.0	24.7	0.7
7	1.058	1824.9	2.86	-23.0	-5.0	22.8
8	1.099	1076.7	1.69	-28.7	3.0	8.8
9	1.108	419.5	0.66	-26.1	23.8	3.8
10	1.045	7351.6	11.51	11.9	1.7	-22.1
11	1.085	2947.1	4.62	13.4	19.6	-52.5
12	1.085	985.2	1.54	9.7	15.8	-82.2
13	1.045	6863.1	10.75	-12.1	1.3	-22.7
14	1.085	2825.2	4.43	-14.7	19.5	-51.8
15	1.085	827.8	1.30	-16.6	17.8	-82.1
16	1.023	30675.7	48.05	-0.0	-6.3	13.7
PARTS						
1	1.029	35124.7	55.01	0.0	-5.0	18.7
2	1.076	3600.3	5.64	23.4	1.8	16.0
3	1.077	3321.1	5.20	-25.3	1.2	15.8
4	1.059	11283.9	17.67	12.1	7.6	-35.3
5	1.059	10516.1	16.47	-13.2	7.5	-35.2
WHOLE BODY						
1	1.044	63846.1	100.00	0.0	0.0	0.0

TABLE # 66 SUBJECT 5 DENSITY 3

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	234122.6	196821.7	166153.3
2	4543271.5	5835015.1	2634599.5
3	286903.1	462651.1	443323.4
4	123849.2	130409.8	40648.8
5	61502.2	12975.2	58379.2
6	5261.1	6719.1	4400.1
7	104195.5	109171.3	35225.3
8	56109.7	8379.7	55767.8
9	5760.9	5144.1	5833.2
10	1351733.6	435729.8	1169131.7
11	403699.5	388300.5	71888.0
12	35402.3	25997.1	17590.6
13	1092629.7	378020.0	918798.4
14	422153.8	414064.3	47808.4
15	27291.7	17782.6	15543.9
16	9330088.1	10622508.1	3254478.1
PARTS			
1	16094245.7	16931247.0	3840600.0
2	755076.2	431854.0	423239.6
3	655526.7	347114.4	406721.7
4	6857657.6	5183171.6	2014039.8
5	5972256.2	4509816.8	1759813.6
WHOLE BODY			
1	73683435.5	76172755.0	18169203.4

TABLE # 67 SUBJECT 5 DENSITY 3

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	2642.5	1217.7	-31470.3
2	25603.7	-9142.4	535546.1
3	1585.2	16911.8	-10296.3
4	-6197.0	-34014.2	14617.3
5	-8368.1	2148.0	-12607.6
6	-1270.4	1476.7	-783.9
7	8273.4	27618.9	20288.7
8	-4469.0	18.5	-4519.5
9	1660.0	-544.9	-1572.2
10	103092.4	-5727.5	-452246.1
11	17391.4	51690.2	98821.6
12	1204.0	-1846.3	-12642.7
13	-15611.2	-25271.3	-372399.0
14	4881.5	31116.8	73096.8
15	-133.2	570.3	-10056.3
16	38609.5	64408.1	1397164.2
PARTS			
1	60943.9	140825.0	2965934.3
2	-31516.3	-42047.2	-260384.1
3	-34076.9	85904.3	-191481.1
4	156603.6	70699.4	-1921627.3
5	-135800.9	300373.2	-1802037.8
WHOLE BODY			
1	57656.5	666951.7	-10166793.7

TABLE # 68 SUBJECT 5 DENSITY 3

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	234584.6	216034.4	146478.5
2	4542765.2	5922771.8	2547349.0
3	285094.2	467494.8	440288.6
4	136230.0	132573.3	26104.5
5	62905.6	8306.2	61644.8
6	6133.3	7456.6	2790.5
7	113117.7	115326.0	20148.4
8	56788.0	7544.6	55924.6
9	7484.6	2910.6	6343.1
10	1413194.6	212179.8	1331220.8
11	417646.6	410742.9	35498.5
12	35603.1	35095.0	8292.0
13	1131290.5	188194.8	1069962.8
14	424378.5	428423.9	31224.0
15	27426.8	26659.3	6532.1
16	9330419.8	10878997.2	2997657.3
PARTS			
1	16095399.6	17572486.7	3198206.3
2	783446.7	659702.5	167020.6
3	685073.1	169252.6	555037.1
4	6894322.1	6052625.4	1107921.6
5	5993654.7	5401301.8	846930.2
WHOLE BODY			
1	73684017.6	77909904.3	16431472.0

TABLE # 69 SUBJECT 6 DENSITY 1

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.000	3517.6	5.81	-0.3	7.5	47.9
2	1.000	24581.2	40.57	0.2	-4.0	18.5
3	1.000	8272.1	13.65	0.0	-10.2	-10.5
4	1.000	1873.7	3.09	22.2	-5.3	20.2
5	1.000	1009.1	1.67	28.7	2.3	4.3
6	1.000	324.9	0.54	28.9	21.4	-1.2
7	1.000	1998.8	3.30	-21.1	-4.1	21.9
8	1.000	1158.2	1.91	-26.3	4.3	7.0
9	1.000	349.9	0.58	-23.8	23.6	0.1
10	1.000	5830.2	9.62	11.2	2.5	-24.0
11	1.000	2292.2	3.78	15.5	18.2	-53.1
12	1.000	631.0	1.04	15.0	15.1	-82.3
13	1.000	5787.3	9.55	-12.3	4.5	-23.9
14	1.000	2274.8	3.75	-15.1	20.5	-53.2
15	1.000	687.8	1.14	-12.4	17.5	-83.3
16	1.000	32853.3	54.22	0.2	-5.5	11.2
PARTS						
1	1.000	36370.9	60.03	0.1	-4.3	14.7
2	1.000	3207.7	5.29	24.9	-0.2	13.0
3	1.000	3506.9	5.79	-23.1	1.4	14.8
4	1.000	8753.4	14.45	12.6	7.6	-35.8
5	1.000	8749.8	14.44	-13.0	9.7	-36.2
WHOLE BODY						
1	1.000	60588.7	100.00	0.0	0.0	0.0

TABLE # 70 SUBJECT 6 DENSITY 1

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	160476.6	139447.3	123256.7
2	4259038.4	5251165.8	2717295.7
3	562031.5	717023.8	658310.3
4	122069.1	123420.6	32492.6
5	49747.7	9320.8	48478.8
6	4152.8	2627.6	4020.4
7	132298.0	137120.1	36456.0
8	59363.0	15027.6	54853.2
9	4962.7	3110.6	4924.9
10	926569.0	329606.1	775035.0
11	308814.6	292092.1	42770.5
12	17117.6	17083.4	10319.2
13	859516.0	294258.0	748306.5
14	331114.4	316876.0	38057.8
15	21349.4	14274.6	12226.5
16	10262802.6	11170008.8	3615985.4
PARTS			
1	15254916.2	15599907.7	4281856.1
2	621941.1	406238.0	325754.4
3	688484.6	422575.5	360046.3
4	4549338.5	3526905.9	1305520.6
5	4737983.4	3699018.5	1276838.8
WHOLE BODY			
1	59754385.9	62303971.6	16277192.4

TABLE # 71 SUBJECT 6 DENSITY 1

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	269.2	720.2	-24027.8
2	-17493.3	47157.3	538020.3
3	-22879.7	-8248.3	-70637.5
4	-6111.9	-25052.1	21023.6
5	5459.4	-252.0	-6595.8
6	-1050.6	152.9	-203.0
7	4985.5	30828.5	15571.6
8	158.8	-636.5	-15134.8
9	1413.0	-385.1	-232.7
10	60382.6	-1439.2	-326235.0
11	816.8	-332.6	70641.2
12	3253.5	-5928.3	-5053.3
13	-82828.0	7169.3	-278438.4
14	-4507.5	-15300.6	65619.2
15	-1913.4	2667.1	-7815.5
16	-32893.7	73717.8	1585033.1
PARTS			
1	-52299.5	19081.3	3085671.7
2	61676.2	-112470.7	-176610.7
3	-31531.4	90366.1	-219108.1
4	187681.0	-288820.2	-1247449.8
5	-158282.0	104928.2	-1262642.5
WHOLE BODY			
1	-417501.9	-106193.1	-7480670.1

TABLE # 72 SUBJECT 6 DENSITY 1

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	160585.2	156601.6	105993.8
2	4259503.4	5361311.6	2606684.9
3	558669.5	766885.9	611810.2
4	127708.6	129000.6	21273.1
5	50772.4	7541.3	49233.5
6	4691.4	2060.0	4049.3
7	141436.0	139425.2	25012.9
8	59033.3	9926.3	60284.2
9	5789.5	2289.9	4918.9
10	967011.9	153527.2	910671.0
11	308473.6	311057.1	24146.6
12	20637.3	19776.5	4106.4
13	903877.3	153414.7	844788.5
14	332817.9	330664.8	22565.5
15	22094.5	21029.9	4726.1
16	10261639.8	11490894.7	3296262.4
PARTS			
1	15252213.8	16389201.1	3495265.1
2	659835.9	543233.4	150864.3
3	715202.6	600821.4	155082.4
4	4585148.7	4080883.9	715732.4
5	4764909.9	4216859.7	732071.1
WHOLE BODY			
1	59705870.7	63537941.0	15091842.2

TABLE # 73 SUBJECT 6 DENSITY 2

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.056	3714.6	6.54	-0.3	6.9	49.2
2	0.853	20967.7	36.94	0.2	-4.6	19.8
3	0.853	7056.1	12.43	0.0	-10.9	-9.2
4	1.005	1883.1	3.32	22.2	-6.0	21.4
5	1.052	1061.6	1.87	28.7	1.6	5.6
6	1.080	350.9	0.62	28.9	20.8	0.1
7	1.005	2008.8	3.54	-21.1	-4.8	23.2
8	1.052	1218.4	2.15	-26.3	3.6	8.3
9	1.080	377.9	0.67	-23.8	23.0	1.4
10	1.020	5946.8	10.48	11.2	1.9	-22.8
11	1.065	2441.2	4.30	15.5	17.6	-51.8
12	1.069	674.5	1.19	15.0	14.4	-81.0
13	1.020	5903.0	10.40	-12.3	3.8	-22.6
14	1.065	2422.6	4.27	-15.1	19.9	-51.9
15	1.069	735.2	1.30	-12.4	16.8	-82.0
16	0.853	28023.8	49.37	0.2	-6.2	12.5
PARTS						
1	0.873	31738.4	55.91	0.1	-4.7	16.8
2	1.027	3295.5	5.81	25.0	-0.7	14.0
3	1.028	3605.1	6.35	-23.1	0.9	15.9
4	1.035	9062.5	15.97	12.6	7.0	-34.9
5	1.036	9060.9	15.96	-13.0	9.2	-35.3
WHOLE BODY						
1	0.937	56762.5	100.00	0.0	0.0	0.0

TABLE # 74 SUBJECT 6 DENSITY 2

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	169463.2	147256.3	130159.0
2	3632959.7	4479244.3	2317853.2
3	479412.9	611621.3	561538.7
4	122679.4	124037.6	32655.1
5	52334.5	9805.5	50999.7
6	4485.0	2837.8	4342.0
7	132959.4	137805.6	36638.3
8	62449.8	15809.0	57705.5
9	5359.7	3359.5	5318.9
10	945099.9	336198.1	790535.3
11	328887.5	311078.0	45550.6
12	18298.7	18262.1	11031.3
13	876705.9	300143.0	763272.2
14	352636.7	337472.8	40531.5
15	22822.5	15259.6	13070.1
16	8754170.6	9528017.5	3084435.5
PARTS			
1	13911048.0	14104054.1	3774703.1
2	647653.7	418272.1	342594.4
3	717193.4	435010.4	378622.5
4	4764523.4	3708618.8	1348391.0
5	4965872.0	3891698.0	1319010.2
WHOLE BODY			
1	59712462.1	62339371.8	16053337.0

TABLE # 75 SUBJECT 6 DENSITY 2

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	284.3	760.5	-25373.3
2	-14921.8	40225.2	458931.3
3	-19516.3	-7035.8	-60253.8
4	-6142.5	-25177.3	21128.7
5	5743.3	-265.1	-6938.8
6	-1134.7	165.1	-219.2
7	5010.4	30982.6	15649.4
8	167.1	-669.6	-15921.7
9	1526.0	-415.9	-251.4
10	61590.3	-1468.0	-332759.6
11	869.9	-354.2	75232.9
12	3478.0	-6337.3	-5402.0
13	-84484.5	7312.7	-284007.1
14	-4800.5	-16295.1	69884.4
15	-2045.4	2851.1	-8354.7
16	-28058.4	62881.3	1352033.2
PARTS			
1	-48083.4	6500.3	2900483.1
2	64655.2	-115888.6	-186217.3
3	-32458.8	92352.2	-230570.4
4	195326.6	-303365.0	-1298767.3
5	-163822.0	108949.2	-1316114.7
WHOLE BODY			
1	-418639.2	-143835.5	-7750707.3

TABLE # 76 SUBJECT 6 DENSITY 2

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	169577.9	165371.2	111929.4
2	3633356.3	4573198.7	2223502.2
3	476545.1	654153.7	521874.1
4	128347.1	129645.5	21379.5
5	53412.6	7933.5	51793.6
6	5066.8	2224.8	4373.3
7	142143.1	140122.2	25138.0
8	62102.9	10442.4	63419.0
9	6252.7	2473.0	5312.4
10	986351.7	156597.6	928884.0
11	328524.2	331275.7	25716.1
12	22061.3	21141.1	4389.8
13	921954.4	156483.0	861683.8
14	354450.9	352157.9	24032.2
15	23619.0	22480.9	5052.2
16	8753178.7	9801733.2	2811711.7
PARTS			
1	13908620.0	14865210.4	3015974.7
2	686704.9	566188.3	155627.0
3	744534.6	626584.1	159707.6
4	4802079.8	4277384.3	742069.0
5	4993796.4	4424161.7	758622.1
WHOLE BODY			
1	59664248.0	63651099.8	14789823.1

TABLE # 77 SUBJECT 6 DENSITY 3

MASS AND CENTER OF GRAVITY (UNITS: C.G.S.)

#	DENSITY	MASS	% MASS	X C.G.	Y C.G.	Z C.G.
SEGMENTS						
1	1.071	3767.4	5.97	-0.3	7.4	48.2
2	1.023	25146.5	39.83	0.2	-4.1	18.7
3	1.023	8462.3	13.40	0.0	-10.3	-10.2
4	1.058	1982.4	3.14	22.2	-5.5	20.4
5	1.099	1109.0	1.76	28.7	2.1	4.5
6	1.108	360.0	0.57	28.9	21.3	-1.0
7	1.058	2114.7	3.35	-21.1	-4.3	22.2
8	1.099	1272.8	2.02	-26.3	4.1	7.3
9	1.108	387.7	0.61	-23.8	23.5	0.4
10	1.045	6092.6	9.65	11.2	2.4	-23.8
11	1.085	2487.0	3.94	15.5	18.1	-52.8
12	1.085	684.6	1.08	15.0	14.9	-82.0
13	1.045	6047.7	9.58	-12.3	4.3	-23.6
14	1.085	2468.1	3.91	-15.1	20.4	-52.9
15	1.085	746.3	1.18	-12.4	17.3	-83.1
16	1.023	33608.9	53.24	0.2	-5.7	11.4
PARTS						
1	1.028	37376.2	59.21	0.1	-4.4	15.2
2	1.076	3451.4	5.47	25.0	-0.3	13.1
3	1.077	3775.2	5.98	-23.2	1.4	14.9
4	1.058	9264.2	14.68	12.6	7.5	-35.9
5	1.059	9262.1	14.67	-13.0	9.7	-36.2
WHOLE BODY						
1	1.042	63129.1	100.00	0.0	0.0	0.0

TABLE # 78 SUBJECT 6 DENSITY 3

MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IXX	IYY	IZZ
SEGMENTS			
1	171870.3	149347.9	132007.8
2	4356995.3	5371941.3	2779792.9
3	574958.1	733515.2	673451.3
4	129149.1	130579.0	34377.2
5	54672.7	10243.5	53278.2
6	4601.3	2911.4	4454.6
7	139971.2	145073.0	38570.5
8	65239.9	16515.3	60283.7
9	5498.7	3446.6	5456.8
10	968263.8	344438.1	809910.9
11	335063.6	316919.7	46406.0
12	18572.6	18535.4	11196.4
13	898193.5	307499.4	781979.6
14	359258.8	343810.1	41292.6
15	23164.0	15487.9	13265.7
16	10498844.5	11426916.3	3699152.2
PARTS			
1	15822017.9	16150576.5	4409674.0
2	674404.7	437450.2	355481.4
3	746657.6	454927.2	392875.8
4	4859654.8	3779726.1	1379019.1
5	5064108.7	3965709.3	1348917.9
WHOLE BODY			
1	63366821.1	66109243.4	17227063.7

TABLE # 79 SUBJECT 6 DENSITY 3

PRODUCTS OF INERTIA (UNITS: C.G.S.)

#	IXY	IXZ	IYZ
SEGMENTS			
1	288.3	771.3	-25733.7
2	-17895.7	48241.9	550394.7
3	-23405.9	-8438.0	-72262.1
4	-6466.4	-26505.1	22242.9
5	5999.9	-276.9	-7248.8
6	-1164.1	169.4	-224.9
7	5274.7	32616.5	16474.7
8	174.6	-699.5	-16633.1
9	1565.6	-426.7	-257.9
10	63099.8	-1504.0	-340915.3
11	886.2	-360.8	76645.6
12	3530.0	-6432.2	-5482.8
13	-86555.2	7491.9	-290967.9
14	-4890.6	-16601.2	71196.8
15	-2076.0	2893.7	-8479.8
16	-33650.3	75413.3	1621488.5
PARTS			
1	-54338.6	17165.5	3221294.6
2	67185.5	-121221.5	-192969.5
3	-33977.2	96904.1	-239148.2
4	199541.8	-309361.6	-1326295.4
5	-167524.1	111432.8	-1343695.1
WHOLE BODY			
1	-441329.8	-127941.6	-8030972.9

TABLE # 80 SUBJECT 6 DENSITY 3

PRINCIPAL MOMENTS OF INERTIA (UNITS: C.G.S.)

#	IPX	IPY	IPZ
SEGMENTS			
1	171986.6	167720.2	113519.2
2	4357470.9	5484620.5	2666638.1
3	571518.8	784524.1	625881.7
4	135115.7	136482.6	22507.0
5	55798.9	8287.9	54107.6
6	5198.1	2282.5	4486.7
7	149639.3	147511.8	26463.7
8	64877.5	10909.0	66252.4
9	6414.8	2537.2	5450.1
10	1010526.6	160435.8	951650.4
11	334693.6	337496.7	26199.1
12	22391.5	21457.5	4455.5
13	944551.0	160318.3	882803.2
14	361107.1	358771.0	24483.5
15	23972.5	22817.4	5127.8
16	10497655.0	11755182.5	3372075.6
PARTS			
1	15819220.8	16979111.5	3583936.2
2	715273.7	589370.6	162692.0
3	775353.5	652081.8	167025.3
4	4897977.1	4362138.9	758283.9
5	5092653.5	4510816.7	775265.8
WHOLE BODY			
1	63315909.7	67445838.4	15941380.1

TABLE # 81 SUBJECT 1 DENSITY 1

DIRECTION COSINES

SEGMENTS

1	0.9941826092	-0.0619870628	-0.0880825954
	-0.1047621815	-0.7464602241	-0.6571316604
	-0.0250164924	0.6625365936	-0.7486116732
2	0.9998963321	-0.0001403860	-0.0143981003
	-0.0012764225	-0.9968798923	-0.0789230705
	0.0143420970	-0.0789332667	0.9967767271
3	0.9894601547	0.0391369956	0.1394162756
	0.0182558047	-0.9888163820	0.1480165138
	0.1436500189	-0.1439112864	-0.9791088876
4	0.8986583746	0.0700831363	0.4330144106
	0.1497688482	-0.9768551039	-0.1527199988
	0.4122892405	0.2020951754	-0.8883552905
5	0.8405405579	0.4912039753	-0.2284955693
	0.4493252540	-0.8677274788	-0.2124990322
	0.3026522536	-0.0759452253	0.9500704901
6	0.8113202093	-0.5808136011	0.0664460592
	-0.5777613879	-0.8139673154	-0.0604068554
	-0.0891700436	-0.0106193352	0.9959598049
7	0.9041910316	-0.0937089004	0.4167219940
	-0.1423716944	-0.9859648702	0.0871984822
	-0.4027019729	0.1381735019	0.9048420881
8	0.0736505622	-0.9738287845	-0.2150188203
	-0.9663010364	-0.1230084169	0.2261221713
	-0.2466534039	0.1911188839	-0.9500714029
9	0.8055738927	0.5908455931	-0.0441835772
	0.5923353393	-0.8048467832	0.0368849739
	0.0137676857	0.0558850662	0.9983422811

TABLE # 81 (CONTINUED)

10	0.4197874837	-0.9075591165	0.0107200032
	-0.9039172305	-0.4169784799	0.0951976243
	-0.0819274612	-0.0496527668	-0.9954006700
11	0.6845998087	0.7212318493	0.1055827708
	0.7225673126	-0.6905577254	0.0320391426
	0.0960186481	0.0543566680	-0.9938942458
12	0.8142180090	-0.0781116921	-0.5752804511
	0.2113048264	-0.8830701462	0.4189718214
	0.5407395900	0.4626939381	0.7025062387
13	0.9817565910	-0.1901403930	-0.0007918437
	-0.1893654100	-0.9781141563	0.0862173922
	-0.0171679224	-0.0844945452	-0.9962760332
14	0.7912525550	-0.6035946222	0.0979434854
	-0.6003145376	-0.7972448840	-0.0634275252
	-0.1163694557	0.0086097067	0.9931686779
15	0.9028101958	0.2431578546	0.3546942461
	-0.0176376957	-0.8031642499	0.5954965149
	-0.4296773931	0.5438763144	0.7208161295
16	0.9996612482	0.0023116538	0.0259238325
	0.0005010490	-0.9975725270	0.0696333425
	0.0260218713	-0.0695967650	-0.9972357557

TABLE # 82 SUBJECT 1 DENSITY 1

DIRECTION COSINES

PARTS

1	0.9997751965	-0.0114562076	-0.0178412964
	0.0110904680	0.9997290484	-0.0204653669
	0.0180709177	0.0202628979	0.9996313605
2	0.7404044114	0.5955142690	0.3117115060
	0.6092717268	-0.7904589287	0.0629495428
	0.2838824941	0.1433088884	-0.9480892849
3	0.7698321775	-0.5643400186	-0.2981254130
	-0.5692295949	-0.8183529545	0.0792219044
	-0.2886799035	0.1087142369	-0.9512334771
4	0.9969140375	-0.0201728687	0.0758647300
	-0.0261826777	-0.9965246474	0.0790765104
	0.0740058732	-0.0808188250	-0.9939775894
5	0.8219887510	-0.5655230841	0.0672170704
	0.5693948881	0.8183947046	-0.0775858810
	-0.0111334878	0.1020477777	0.9947171942

WHOLE BODY

1	0.9996372425	-0.0153036577	0.0221626136
	-0.0162994629	-0.9988326752	0.0454710287
	0.0214408696	-0.0458157724	-0.9987197826

TABLE # 83 SUBJECT 1 DENSITY 2

DIRECTION COSINES

SEGMENTS

1	0.9941826092	-0.0619870628	-0.0880825954
	-0.1047621815	-0.7464602241	-0.6571316604
	-0.0250164924	0.6625365936	-0.7486116732
2	0.9998963321	-0.0001403860	-0.0143981003
	-0.0012764225	-0.9968798923	-0.0789230705
	0.0143420970	-0.0789332667	0.9967767271
3	0.9894601547	0.0391369956	0.1394162756
	0.0182558047	-0.9888163820	0.1480165138
	0.1436500189	-0.1439112864	-0.9791088876
4	0.8986583746	0.0700831363	0.4330144106
	0.1497688482	-0.9768551039	-0.1527199988
	0.4122892405	0.2020951754	-0.8883552905
5	0.8405405579	0.4912039753	-0.2284955693
	0.4493252540	-0.8677274788	-0.2124990322
	0.3026522536	-0.0759452253	0.9500704901
6	0.8113202093	-0.5808136011	0.0664460592
	-0.5777613879	-0.8139673154	-0.0604068554
	-0.0891700436	-0.0106193352	0.9959598049
7	0.9041910316	-0.0937089004	0.4167219940
	-0.1423716944	-0.9859648702	0.0871984822
	-0.4027019729	0.1381735019	0.9048420881
8	0.0736505622	-0.9738287845	-0.2150188203
	-0.9663010364	-0.1230084169	0.2261221713
	-0.2466534039	0.1911188839	-0.9500714029
9	0.8055738927	0.5908455931	-0.0441835772
	0.5923353393	-0.8048467832	0.0368849739
	0.0137676857	0.0558850662	0.9983422811

TABLE # 83 (CONTINUED)

10	0.4197874837	-0.9075591165	0.0107200032
	-0.9039172305	-0.4169784799	0.0951976243
	-0.0819274612	-0.0496527668	-0.9954006700
11	0.6845998087	0.7212318493	0.1055827708
	0.7225673126	-0.6905577254	0.0320391426
	0.0960186481	0.0543566680	-0.9938942458
12	0.8142180090	-0.0781116921	-0.5752804511
	0.2113048264	-0.8830701462	0.4189718214
	0.5407395900	0.4626939381	0.7025062387
13	0.9817565910	-0.1901403930	-0.0007918437
	-0.1893654100	-0.9781141563	0.0862173922
	-0.0171679224	-0.0844945452	-0.9962760332
14	0.7912525550	-0.6035946222	0.0979434854
	-0.6003145376	-0.7972448840	-0.0634275252
	-0.1163694557	0.0086097067	0.9931686779
15	0.9028101958	0.2431578546	0.3546942461
	-0.0176376957	-0.8031642499	0.5954965149
	-0.4296773931	0.5438763144	0.7208161295
16	0.9996612482	0.0023116538	0.0259238328
	0.0005010490	-0.9975725270	0.0696333423
	0.0260218716	-0.0695967648	-0.9972357557

TABLE # 84 SUBJECT 1 DENSITY 2

DIRECTION COSINES

PARTS

1	0.9997711911	-0.0130629351	-0.0169388630
	0.0128156246	0.9998108809	-0.0146274455
	0.0171267369	0.0144070165	0.9997495250
2	0.7351150134	0.6029266841	0.3099763390
	0.6164039526	-0.7847734837	0.0646277535
	0.2822270085	0.1435618087	-0.9485451611
3	0.7632860099	-0.5740165406	-0.2964784618
	-0.5789410819	-0.8113901164	0.0804568373
	-0.2867432491	0.1102319831	-0.9516444814
4	0.9969904787	-0.0146668035	0.0761240455
	-0.0207114616	-0.9966408817	0.0792337568
	0.0747062299	-0.0805719413	-0.9939452407
5	0.8384061560	-0.5408501815	0.0674996209
	0.5448587156	0.8349122626	-0.0777849195
	-0.0142862734	0.1019931122	0.9946825159

WHOLE BODY

1	0.9996363100	-0.0158502509	0.0218178218
	-0.0168158910	-0.9988539194	0.0448115337
	0.0210825428	-0.0451621223	-0.9987571823

TABLE # 85 SUBJECT 1 DENSITY 3

DIRECTION COSINES

SEGMENTS

1	0.9941826092	-0.0619870628	-0.0880825954
	-0.1047621815	-0.7464602241	-0.6571316604
	-0.0250164924	0.6625365936	-0.7486116732
2	0.9998963321	-0.0001403860	-0.0143981003
	-0.0012764225	-0.9968798923	-0.0789230705
	0.0143420970	-0.0789332647	0.9967767271
3	0.9894601547	0.0391369956	0.1394162756
	0.0182558047	-0.9888163820	0.1480165138
	0.1436500189	-0.1439112864	-0.9791088876
4	0.8986583746	0.0700831363	0.4330144106
	0.1497688482	-0.9768551039	-0.1527199988
	0.4122892405	0.2020951754	-0.8883552905
5	0.8405405579	0.4912039753	-0.2284955693
	0.4493252540	-0.8677274788	-0.2124990322
	0.3026522536	-0.0759452253	0.9500704901
6	0.8113202093	-0.5808136011	0.0664460592
	-0.5777613879	-0.8139673154	-0.0604068554
	-0.0891700436	-0.0106193352	0.9959598049
7	0.9041910316	-0.0937089004	0.4167219940
	-0.1423716944	-0.9859648702	0.0871984822
	-0.4027019729	0.1381735019	0.9048420881
8	0.0736505622	-0.9738287845	-0.2150188203
	-0.9663010364	-0.1230084169	0.2261221713
	-0.2466534039	0.1911188839	-0.9500714029
9	0.8055738927	0.5908455931	-0.0441835772
	0.5923353393	-0.8048467832	0.0368849739
	0.0137676857	0.0558850662	0.9983422811

TABLE # 85 (CONTINUED)

10	0.4197874837	-0.9075591165	0.0107200032
	-0.9039172305	-0.4169784799	0.0951976243
	-0.0819274612	-0.0496527668	-0.9954006700
11	0.6845998087	0.7212318493	0.1055827708
	0.7225673126	-0.6905577254	0.0320391426
	0.0960186481	0.0543566680	-0.9938942458
12	0.8142180090	-0.0781116921	-0.5752804511
	0.2113048264	-0.8830701462	0.4189718214
	0.5407395900	0.4626939381	0.7025062387
13	0.9817565910	-0.1901403930	-0.0007918437
	-0.1893654100	-0.9781141563	0.0862173922
	-0.0171679224	-0.0844945452	-0.9962760332
14	0.7912525550	-0.6035946222	0.0979434854
	-0.6003145376	-0.7972448840	-0.0634275252
	-0.1163694557	0.0086097067	0.9931686779
15	0.9028101958	0.2431578546	0.3546942461
	-0.0176376957	-0.8031642499	0.5954965149
	-0.4296773931	0.5438763144	0.7208161295
16	0.9996612482	0.0023116538	0.0259238326
	0.0005010490	-0.9975725270	0.0696333425
	0.0260218713	-0.0695967650	-0.9972357557

TABLE # 86 SUBJECT 1 DENSITY 3

DIRECTION COSINES

PARTS

1	0.9997748478	-0.0117823510	-0.0176473795
	0.0114428563	0.9997498591	-0.0192166657
	0.0178693827	0.0190104026	0.9996595869
2	0.7367213067	0.6005846967	0.3107084459
	0.6142076603	-0.7865445721	0.0640045788
	0.2828262122	0.1436859706	-0.9483478663
3	0.7652619071	-0.5710183974	-0.2971736922
	-0.5759715607	-0.8135439511	0.0800187528
	-0.2874560397	0.1099282920	-0.9514645531
4	0.9969821175	-0.0153787308	0.0760930482
	-0.0214144870	-0.9966325199	0.0791520054
	0.0746195490	-0.0805426275	-0.9939541277
5	0.8354881927	-0.5453521631	0.0674573798
	0.5493363928	0.8319806757	-0.0777025270
	-0.0137479952	0.1019763376	0.9946918212

WHOLE BODY

1	0.9996360546	-0.0155091933	0.0220731356
	-0.0164988481	-0.9988334096	0.0453829029
	0.0213435331	-0.0457305674	-0.9987257726

TABLE # 87 SUBJECT 2 DENSITY 1

DIRECTION COSINES

SEGMENTS

1	0.9989211707	-0.0393372912	0.0246793881
	-0.0181370476	-0.8197240714	-0.5724713917
	0.0427497623	0.5714061816	-0.8195531914
2	0.9997434797	-0.0222098435	0.0044382054
	0.0225684858	0.9933811153	-0.1126260326
	-0.0019074229	0.1126973054	0.9936275354
3	0.9927027531	-0.0903013765	-0.0799181162
	-0.0228175611	-0.7914326967	0.6108302919
	-0.1184086264	-0.6045493760	-0.7877178741
4	0.3894248376	-0.8700527075	-0.3022525138
	-0.8787498432	-0.4492776844	0.1610846840
	0.2759474749	-0.2028739722	0.9395185695
5	0.9034947863	-0.1813850637	0.3883254175
	-0.2626829330	-0.9502668027	0.1673041552
	0.3386662781	-0.2531648916	-0.9062078623
6	0.9433427784	0.2776317413	0.1817278699
	0.2885142248	-0.9568012348	-0.0359296429
	0.1639022410	0.0863250446	-0.9826922418
7	0.8606870008	-0.3162305857	0.3990189260
	-0.3817713455	-0.9193760261	0.0948596988
	-0.3368508964	0.2339785019	0.9120227707
8	0.9381565432	-0.0160224129	-0.3458404008
	0.0443237192	-0.9851498042	0.1658772773
	-0.3433623574	-0.1709477859	-0.9235145619
9	0.8156682404	-0.5686651300	0.1063263444
	-0.5743178119	-0.8180617138	0.0305627768
	0.0696015261	-0.0859941999	-0.9938614718

TABLE # 87 (CONTINUED)

10	0.7248381737	-0.6885026360	-0.0239529145
	-0.6842298932	-0.7154193396	-0.1414376957
	-0.0802438481	-0.1189087411	0.9896573327
11	0.7526329533	0.6575810196	-0.0336279701
	0.6577087861	-0.7532224298	-0.0086674065
	0.0310288633	0.0155940357	0.9993968359
12	0.9863743630	-0.1538509455	-0.0582709418
	-0.1603674141	-0.8201234074	-0.5492539386
	0.0367138744	0.5511147640	-0.8336213818
13	0.9948221029	0.0944175844	0.0376072256
	0.0902697830	-0.9908974259	0.0998682010
	0.0466942173	-0.0959562977	-0.9942897158
14	0.9348309770	0.3497654441	-0.0612795116
	0.3535731318	-0.9328140135	0.0695992576
	-0.0328189719	-0.0867303308	-0.9956910991
15	0.9766014420	-0.1604061855	-0.1432462186
	-0.2103846233	-0.8506918057	-0.4817278921
	-0.0445862507	0.5005929558	-0.8645338390
16	0.9998155620	-0.0191769612	0.0010421723
	0.0191952777	0.9960742928	-0.0864149559
	0.0006190952	0.0864190225	0.9962586859

TABLE # 88 SUBJECT 2 DENSITY 1

DIRECTION COSINES

PARTS

1	0.9997340920	-0.0230060877	0.0015701293
	0.0230467437	0.9991313977	-0.0347173972
	-0.0007700540	0.0347443520	0.9993959361
2	0.9200270282	0.1530656926	-0.3607231087
	0.1499400551	-0.9880092862	-0.0368188843
	0.3620334892	0.0202124741	0.9319459258
3	0.7456337589	-0.5571682278	-0.3655049431
	-0.5767104814	-0.8143660215	0.0649076556
	-0.3338192898	0.1623931925	-0.9285435546
4	0.9644873273	-0.2602180419	0.0452853866
	-0.2632411619	-0.9610581728	0.0840908984
	0.0216399219	-0.0930255837	-0.9954285281
5	0.9755177925	-0.2173829537	-0.0333119792
	-0.2137488112	-0.9728341640	0.0889108262
	-0.0517347295	-0.0796136970	-0.9954823841

WHOLE BODY

1	0.9996841587	0.0241988463	-0.0067822315
	0.0237699003	-0.9980653837	-0.0574498181
	0.0081593298	-0.0572704601	0.9983253577

TABLE # 89 SUBJECT 2 DENSITY 2

DIRECTION COSINES

SEGMENTS

1	0.9989211707	-0.0393372912	0.0246793881
	-0.0181370476	-0.8197240714	-0.5724713917
	0.0427497623	0.5714061816	-0.8195531914
2	0.9997434797	-0.0222098435	0.0044382054
	0.0225684858	0.9933811153	-0.1126260326
	-0.0019074229	0.1126973054	0.9936275354
3	0.9927027531	-0.0903013765	-0.0799181162
	-0.0228175611	-0.7914326967	0.6108302919
	-0.1184086264	-0.6045493760	-0.7877178741
4	0.3894248376	-0.8700527075	-0.3022525138
	-0.8787498432	-0.4492776844	0.1610846840
	0.2759474749	-0.2028739722	0.9395185695
5	0.9034947863	-0.1813850637	0.3883254175
	-0.2626829330	-0.9502668027	0.1673041552
	0.3386662781	-0.2531648916	-0.9062078623
6	0.9433427784	0.2776317413	0.1817278699
	0.2885142248	-0.9568012348	-0.0359296429
	0.1639022410	0.0863250446	-0.9826922418
7	0.8606870008	-0.3162305857	0.3990189260
	-0.3817713455	-0.9193760261	0.0948596988
	-0.3368508964	0.2339785019	0.9120227707
8	0.9381565432	-0.0160224129	-0.3458404008
	0.0443237192	-0.9851498042	0.1658772773
	-0.3433623574	-0.1709477859	-0.9235145619
9	0.8156682404	-0.5686651300	0.1063263444
	-0.5743178119	-0.8180617138	0.0305627768
	0.0696015261	-0.0859941999	-0.9938614718

TABLE # 89 (CONTINUED)

10	0.7248381737	-0.6885026360	-0.0239529145
	-0.6842298932	-0.7154193396	-0.1414376957
	-0.0802438481	-0.1189087411	0.9896573327
11	0.7526329533	0.6575810196	-0.0336279701
	0.6577087861	-0.7532224298	-0.0086674065
	0.0310288633	0.0155940357	0.9993968359
12	0.9863743630	-0.1538509455	-0.0582709418
	-0.1603674141	-0.8201234074	-0.5492539386
	0.0367138744	0.5511147640	-0.8336213818
13	0.9948221029	0.0944175844	0.0376072256
	0.0902697830	-0.9908974259	0.0998682010
	0.0466942173	-0.0959562977	-0.9942897158
14	0.9348309770	0.3497654441	-0.0612795116
	0.3535731318	-0.9328140135	0.0695992576
	-0.0328189719	-0.0867303308	-0.9956910991
15	0.9766014420	-0.1604061855	-0.1432462186
	-0.2103846233	-0.8506918057	-0.4817278921
	-0.0445862507	0.5005929558	-0.8645338390
16	0.9998155620	-0.0191769612	0.0010421723
	0.0191952777	0.9960742927	-0.0864149563
	0.0006190952	0.0864190229	0.9962586859

TABLE # 90 | SUBJECT 2 | DENSITY 2

DIRECTION COSINES

PARTS

1	0.9997149896	-0.0238181643	0.0016231607
	0.0238543317	0.9993221124	-0.0280408006
	-0.0009541800	0.0280715281	0.9996054616
2	0.9201134889	0.1525907008	-0.3607038196
	0.1488840831	-0.9881156657	-0.0382225197
	0.3622494959	0.0185340015	0.9318968792
3	0.7374646702	-0.5686510812	-0.3643923821
	-0.5886625187	-0.8056834657	0.0659590179
	-0.3310925842	0.1658616921	-0.9289066691
4	0.9657509610	-0.2554887150	0.0452835271
	-0.2585262334	-0.9623458466	0.0839920124
	0.0221194029	-0.0928223464	-0.9954369613
5	0.9750118653	-0.2196145440	-0.0334860346
	-0.2159520587	-0.9723328479	0.0890704285
	-0.0521207329	-0.0796133466	-0.9954622767

WHOLE BODY

1	0.9996848117	0.0240980601	-0.0070399406
	0.0236608965	-0.9981113121	-0.0566918925
	0.0083928090	-0.0565074526	0.9983669008

TABLE # 91 SUBJECT 2 DENSITY 3

DIRECTION COSINES

SEGMENTS

1	0.9989211707	-0.0393372912	0.0246793881
	-0.0181370476	-0.8197240714	-0.5724713917
	0.0427497623	0.5714061816	-0.8195531914
2	0.9997434797	-0.0222098435	0.0044382054
	0.0225684858	0.9933811153	-0.1126260326
	-0.0019074229	0.1126973054	0.9936275354
3	0.9927027531	-0.0903013765	-0.0799181162
	-0.0228175611	-0.7914326967	0.6108302919
	-0.1184086264	-0.6045493760	-0.7877178741
4	0.3894248376	-0.8700527075	-0.3022525138
	-0.8787498432	-0.4492776844	0.1610846840
	0.2759474749	-0.2028739722	0.9395185695
5	0.9034947863	-0.1813850637	0.3883254175
	-0.2626829330	-0.9502668027	0.1673041552
	0.3386662781	-0.2531648916	-0.9062078623
6	0.9433427784	0.2776317413	0.1817278699
	0.2885142248	-0.9568012348	-0.0359296429
	0.1639022410	0.0863250446	-0.9826922418
7	0.8606870008	-0.3162305857	0.3990189260
	-0.3817713455	-0.9193760261	0.0948596988
	-0.3368508964	0.2339785019	0.9120227707
8	0.9381565432	-0.0160224129	-0.3458404008
	0.0443237192	-0.9851498042	0.1658772773
	-0.3433623574	-0.1709477859	-0.9235145619
9	0.8156682404	-0.5686651300	0.1063263444
	-0.5743178119	-0.8180617138	0.0305627768
	0.0696015261	-0.0859941999	-0.9938614718

TABLE # 91 (CONTINUED)

10	0.7248381737	-0.6885026360	-0.0239529145
	-0.6842298932	-0.7154193396	-0.1414376957
	-0.0802438481	-0.1189087411	0.9896573327
11	0.7526329533	0.6575810196	-0.0336279701
	0.6577087861	-0.7532224298	-0.0086674065
	0.0310288633	0.0155940357	0.9993968359
12	0.9863743630	-0.1538509455	-0.0582709418
	-0.1603674141	-0.8201234074	-0.5492539386
	0.0367138744	0.5511147640	-0.8336213818
13	0.9948221029	0.0944175844	0.0376072256
	0.0902697830	-0.9908974259	0.0998682010
	0.0466942173	-0.0959562977	-0.9942897158
14	0.9348309770	0.3497654441	-0.0612795116
	0.3535731318	-0.9328140135	0.0695992576
	-0.0328189719	-0.0867303308	-0.9956910991
15	0.9766014420	-0.1604061855	-0.1432462186
	-0.2103846233	-0.8506918057	-0.4817278921
	-0.0445862507	0.5005929558	-0.8645338390
16	0.9998155620	-0.0191769612	0.0010421723
	0.0191952777	0.9960742928	-0.0864149558
	0.0006190952	0.0864190224	0.9962586859

TABLE # 92 SUBJECT 2 DENSITY 3

DIRECTION COSINES

PARTS

1	0.9997303435	-0.0231676170	0.0015816982
	0.0232074536	0.9991759257	-0.0332999044
	-0.0008089153	0.0333276320	0.9994441528
2	0.9201065813	0.1525158664	-0.3607530866
	0.1490118598	-0.9881168683	-0.0376897881
	0.3622145009	0.0190778663	0.9318995066
3	0.7398392433	-0.5652201887	-0.3649164733
	-0.5851490321	-0.8082691059	0.0655870620
	-0.3320218432	0.1650066388	-0.9287272500
4	0.9655150418	-0.2563763611	0.0452975231
	-0.2594116919	-0.9621089457	0.0839758941
	0.0220517181	-0.0928306960	-0.9954376844
5	0.9750846720	-0.2192920070	-0.0334798164
	-0.2156345948	-0.9724097603	0.0889998856
	-0.0520730638	-0.0795630176	-0.9954687952

WHOLE BODY

1	0.9996878542	0.0240177683	-0.0068804748
	0.0235844240	-0.9980762944	-0.0573365975
	0.0082443359	-0.0571564281	0.9983311944

TABLE # 93 SUBJECT 3 DENSITY 1

DIRECTION COSINES

SEGMENTS

1	0.9951488349	0.0103411312	0.0978358701
	-0.0577325695	-0.7438425649	0.6658567332
	-0.0796601964	0.6682748684	0.7396370417
2	0.9984977964	-0.0281977524	-0.0469791165
	-0.0240094656	-0.9958798124	0.0874468110
	-0.0492513572	-0.0861875046	-0.9950608111
3	0.9914018972	0.0006149834	-0.1308506782
	-0.0507153282	-0.9200210881	-0.3885732274
	-0.1206243494	0.3918683699	-0.9120794631
4	0.4291542169	-0.7994491641	-0.4203661405
	-0.7999887185	-0.5524965152	0.2340206209
	0.4193384175	-0.2358572337	0.8766565216
5	0.9281593629	-0.3372361015	0.1574547836
	-0.3687744676	-0.8904304260	0.2667190441
	0.0502552394	-0.3056230821	-0.9508254007
6	0.7708479517	0.5685110625	-0.2873823364
	0.5069614706	-0.8206613985	-0.2636378887
	-0.3857246463	0.0575329547	-0.9208183623
7	0.8309464973	-0.3062232094	0.4644946336
	-0.3824485029	-0.9207496018	0.0771577177
	-0.4040557650	0.2417592125	0.8822082645
8	0.6169448660	-0.6088365556	0.4986953787
	-0.5917235216	-0.7766298153	-0.2161235849
	-0.5188856389	0.1617534496	0.8394006881
9	0.9815996731	-0.1579030526	0.1073718200
	-0.1418273189	-0.9794009278	-0.1437318133
	0.1278557522	0.1258588436	-0.9837745972

TABLE # 93 (CONTINUED)

10	0.9434709165	0.3218803910	-0.0790926266
	0.3246696999	-0.9454961957	0.0250305785
	-0.0667249252	-0.0492946022	-0.9965529723
11	0.8241158027	0.5634036753	0.0583904315
	0.5653586163	-0.8244990781	-0.0238936242
	0.0346811013	0.0527026468	-0.9980078418
12	0.7521970277	-0.0519609493	-0.6568863610
	0.3349148968	0.8886669775	0.3132140082
	0.5674783198	-0.4555996738	0.6858551551
13	0.9491031243	-0.3149623643	-0.0014030418
	0.3148677448	0.9489101409	-0.0206844824
	0.0078461940	0.0191899343	0.9997850687
14	0.8101219598	-0.5761505502	-0.1084110408
	-0.5797235509	-0.8148112920	-0.0017784625
	-0.0873098780	0.0642892050	-0.9941045636
15	0.7136840495	0.0112590057	0.7003772643
	-0.4339610321	0.7919782013	0.4294745060
	-0.5498480701	-0.6104455450	0.5701081796
16	0.9986230973	-0.0276021073	-0.0446097880
	-0.0262072874	-0.9991583673	0.0315552699
	-0.0454432349	-0.0303427198	-0.9985059999

TABLE # 94 SUBJECT 3 DENSITY 1

DIRECTION COSINES

PARTS

1	0.9987154770	-0.0329217763	0.0385169145
	-0.0333236303	-0.9993961929	0.0098379494
	-0.0381697749	0.0111088358	0.9992095186
2	0.6935390579	-0.6730619368	-0.2568875326
	-0.6994281069	-0.7145190215	-0.0162139200
	0.1726380560	-0.1909193474	0.9663052853
3	0.8106827995	-0.3683897169	0.4550630891
	-0.3863497480	-0.9205907133	-0.0569790377
	-0.4399173453	0.1296215840	0.8886343310
4	0.9119975861	0.4088783384	-0.0328467263
	0.4091734934	-0.9124531103	0.0025246557
	0.0289388205	0.0157424896	0.9994572120
5	0.8603612317	-0.5005391705	-0.0961201838
	-0.5025914557	-0.8645178424	0.0032754811
	-0.0847371205	0.0454910862	-0.9953643461

WHOLE BODY

1	0.9989493345	-0.0204303767	0.0410222715
	-0.0209412693	-0.9997079293	0.0120631412
	-0.0407638355	0.0129095253	0.9990854087

TABLE # 95 SUBJECT 3 DENSITY 2

DIRECTION COSINES

SEGMENTS

1	0.9951488349	0.0103411312	0.0978358701
	-0.0577325695	-0.7438425649	0.6658567332
	-0.0796601964	0.6682748684	0.7396370417
2	0.9984977964	-0.0281977524	-0.0469791165
	-0.0240094656	-0.9958798124	0.0874468110
	-0.0492513572	-0.0861875046	-0.9950608111
3	0.9914018972	0.0006149834	-0.1308506782
	-0.0507153282	-0.9200210881	-0.3885732274
	-0.1206243494	0.3918683699	-0.9120794631
4	0.4291542169	-0.7994491641	-0.4203661405
	-0.7999887185	-0.5524965152	0.2340206209
	0.4193384175	-0.2358572337	0.8766565216
5	0.9281593629	-0.3372361015	0.1574547836
	-0.3687744676	-0.8904304260	0.2667190441
	0.0502552394	-0.3056230821	-0.9508254007
6	0.7708479517	0.5685110625	-0.2873823364
	0.5069614706	-0.8206613985	-0.2636378887
	-0.3857246463	0.0575329547	-0.9208183623
7	0.8309464973	-0.3062232094	0.4644946336
	-0.3824485029	-0.9207496018	0.0771577177
	-0.4040557650	0.2417592125	0.8822082645
8	0.6169448660	-0.6088365556	-0.4986953787
	-0.5917235216	-0.7766298153	0.2161235849
	-0.5188856389	0.1617534496	-0.8394006881
9	0.9815996731	-0.1579030526	0.1073718200
	-0.1418273189	-0.9794009278	-0.1437318133
	0.1278557522	0.1258588436	-0.9837745972

TABLE # 95 (CONTINUED)

10	0.9434709165	0.3218803910	-0.0790926266
	0.3246696999	-0.9454961957	0.0250305785
	-0.0667249252	-0.0492946022	-0.9965529723
11	0.8241158027	0.5634036753	0.0583904315
	0.5653586163	-0.8244990781	-0.0238936242
	0.0346811013	0.0527026468	-0.9980078418
12	0.7521970277	-0.0519609493	-0.6568863610
	0.3349148968	0.8886669775	0.3132140082
	0.5674783198	-0.4555996738	0.6858551551
13	0.9491031243	-0.3149623643	-0.0014030418
	0.3148677448	0.9489101409	-0.0206844824
	0.0078461940	0.0191899343	0.9997850687
14	0.8101219598	-0.5761505502	-0.1084110408
	-0.5797235509	-0.8148112920	-0.0017784625
	-0.0873098780	0.0642892050	-0.9941045636
15	0.7136840495	0.0112590057	0.7003772643
	-0.4339610321	0.7919782013	0.4294745060
	-0.5498480701	-0.6104455450	0.5701081796
16	0.9986230973	-0.0276021073	-0.0446097880
	-0.0262072874	-0.9991583674	0.0315552693
	-0.0454432349	-0.0303427192	-0.9985059999

TABLE # 96 SUBJECT 3 DENSITY 2

DIRECTION COSINES

PARTS

1	0.9987166764	-0.0337554265	0.0377567399
	-0.0343525109	-0.9992929870	0.0152784521
	-0.0372143148	0.0165558837	0.9991701544
2	0.6996207665	-0.6676566764	-0.2544903645
	-0.6936134941	-0.7201337331	-0.0175421556
	0.1715549589	-0.1887908073	0.9669161945
3	0.8088293523	-0.3735240198	0.4541749504
	-0.3916209948	-0.9183087751	-0.0578099464
	-0.4386662459	0.1311060644	0.8890349400
4	0.9145577549	0.4030860888	-0.0332523362
	0.4033808659	-0.9150290397	0.0023944906
	0.0294616675	0.0156032561	0.9994441198
5	0.8686268308	-0.4859893306	-0.0964458363
	-0.4879730874	-0.8728519592	0.0034239216
	-0.0858469266	0.0440888623	-0.9953323452

WHOLE BODY

1	0.9989598167	-0.0204864243	0.0407380782
	-0.0210198666	-0.9996982719	0.0127094629
	-0.0404654150	0.0135525517	0.9990890243

TABLE # 97 SUBJECT 3 DENSITY 3

DIRECTION COSINES

SEGMENTS

1	0.9951488349	0.0103411312	0.0978358701
	-0.0577325695	-0.7438425649	0.6658567332
	-0.0796601964	0.6682748684	0.7396370417
2	0.9984977964	-0.0281977524	-0.0469791165
	-0.0240094656	-0.9958798124	0.0874468110
	-0.0492513572	-0.0861875046	-0.9950608111
3	0.9914018972	0.0006149834	-0.1308506782
	-0.0507153282	-0.9200210881	-0.3885732274
	-0.1206243494	0.3918683699	-0.9120794631
4	0.4291542169	-0.7994491641	-0.4203661405
	-0.7999887185	-0.5524965152	0.2340206209
	0.4193384175	-0.2358572337	0.8766565216
5	0.9281593629	-0.3372361015	0.1574547836
	-0.3687744676	-0.8904304260	0.2667190441
	0.0502552394	-0.3056230821	-0.9508254007
6	0.7708479517	0.5685110625	-0.2873823364
	0.5069614706	-0.8206613985	-0.2636378887
	-0.3857246463	0.0575329547	-0.9208183623
7	0.8309464973	-0.3062232094	0.4644946336
	-0.3824485029	-0.9207496018	0.0771577177
	-0.4040557650	0.2417592125	0.8822082645
8	0.6169448660	-0.6088365556	-0.4986953787
	-0.5917235216	-0.7766298153	0.2161235849
	-0.5188856389	0.1617534496	-0.8394006881
9	0.9815996731	-0.1579030526	0.1073718200
	-0.1418273189	-0.9794009278	-0.1437318133
	0.1278557522	0.1258588436	-0.9837745972

TABLE # 97 (CONTINUED)

10	0.9434709165	0.3218803910	-0.0790926266
	0.3246696999	-0.9454961957	0.0250305785
	-0.0667249252	-0.0492946022	-0.9965529723
11	0.8241158027	0.5634036753	0.0583904315
	0.5653586163	-0.8244990781	-0.0238936242
	0.0346811013	0.0527026468	-0.9980078418
12	0.7521970277	-0.0519609493	-0.6568863610
	0.3349148968	0.8886669775	0.3132140082
	0.5674783198	-0.4555996738	0.6858551551
13	0.9491031243	-0.3149623643	-0.0014030418
	0.3148677448	0.9489101409	-0.0206844824
	0.0078461940	0.0191899343	0.9997850687
14	0.8101219598	-0.5761505502	-0.1084110408
	-0.5797235509	-0.8148112920	-0.0017784625
	-0.0873098780	0.0642892050	-0.9941045636
15	0.7136840495	0.0112590057	0.7003772643
	-0.4339610321	0.7919782013	0.4294745060
	-0.5498480701	-0.6104455450	0.5701081796
16	0.9986230973	-0.0276021073	-0.0446097880
	-0.0262072874	-0.9991583673	0.0315552704
	-0.0454432349	-0.0303427203	-0.9985059998

TABLE # 98 SUBJECT 3 DENSITY 3

DIRECTION COSINES

PARTS

1	0.9987160035	-0.0330942544	0.0383551120
	-0.0335382641	-0.9993769963	0.0109910936
	-0.0379674746	0.0122633449	0.9992037236
2	0.6975164747	-0.6694685136	-0.2555047493
	-0.6956115229	-0.7182136648	-0.0171388696
	0.1720330688	-0.1896866917	0.9666558758
3	0.8094502903	-0.3716277244	0.4546240886
	-0.3896767288	-0.9191524966	-0.0575389868
	-0.4392519488	0.1305814781	0.8888229312
4	0.9140107314	0.4043285963	-0.0332079661
	0.4046257077	-0.9144790361	0.0024757329
	0.0293669792	0.0156996433	0.9994453971
5	0.8669970904	-0.4888972803	-0.0964131454
	-0.4909001124	-0.8712094235	0.0033496328
	-0.0856336671	0.0444251020	-0.9953357651

WHOLE BODY

1	0.9989487795	-0.0205383125	0.0409818708
	-0.0210543434	-0.9997038932	0.0122000194
	-0.0407191680	0.0130500409	0.9990854047

TABLE # 99 SUBJECT 4 DENSITY 1

DIRECTION COSINES

SEGMENTS

1	0.9895492014	-0.0418454119	-0.1379903601
	-0.1199200676	-0.7702270303	-0.6263940447
	0.0800721884	-0.6363955400	0.7671956473
2	0.9974727290	-0.0448652025	-0.0550932717
	-0.0324087699	-0.9773489566	0.2091379657
	0.0632283688	0.2068239122	0.9763329569
3	0.9992668403	-0.0213186104	-0.0318009221
	-0.0023412639	-0.8630973438	0.5050321708
	-0.0382138755	-0.5045874472	-0.8625144682
4	0.8708175477	-0.2833889192	0.4017057618
	-0.2020106159	-0.9512295393	-0.2331396031
	0.4481835669	0.1218732291	-0.8855949449
5	0.9921273292	0.0875298852	0.0895649586
	0.1083096578	-0.9587524795	-0.2627978331
	0.0628679620	0.2704296623	-0.9606848688
6	0.8200932199	0.5175014103	0.2442117954
	0.5432739491	-0.5700906765	-0.6163197521
	0.1797234732	-0.6381135565	0.7486725333
7	0.9577680051	0.1820052614	-0.2226084750
	0.1566955738	-0.9794920861	-0.1266560317
	-0.2410953037	0.0864253321	-0.9666456003
8	0.9792094032	-0.0353736472	0.1997439605
	0.0232411024	-0.9586302268	-0.2837039643
	0.2015162421	0.2824478594	-0.9378776098
9	0.7054655719	-0.5344848789	0.4654505785
	-0.6892601357	-0.6703153642	0.2749505006
	-0.1650417890	0.5147846411	0.8412835320

TABLE # 99 (CONTINUED)

10	0.7571531104	0.0446287621	0.6517111638
	-0.3570307508	0.8637383765	0.3556473816
	-0.5470358402	-0.5019604473	0.6699160387
11	0.8802668324	0.4735816171	0.0291677173
	0.4578128028	-0.8638905521	0.2100013130
	-0.1246504768	0.1715038362	0.9772659274
12	0.7703309013	0.2581323431	-0.5830591701
	0.1221379873	0.8377314894	0.5322483103
	0.6258375304	-0.4812209941	0.6138026884
13	0.7713868686	0.1168244863	0.6255512276
	-0.3916557740	0.8619315269	0.3219934745
	-0.5015656025	-0.4933822882	0.7106376461
14	0.9967686758	0.0231134735	-0.0769283711
	-0.0006241896	-0.9554487080	-0.2951565291
	-0.0803232054	0.2942508006	-0.9523469163
15	0.7168966987	0.3851592343	-0.5811294930
	0.6039912668	-0.7594378418	0.2417616886
	0.3482149811	0.5243152951	0.7770712955
16	0.9971498173	-0.0396730284	-0.0641739252
	-0.0259608465	-0.9790654720	0.2018832237
	0.0708397933	0.1996418102	0.9773049019

TABLE # 100 SUBJECT 4 DENSITY 1

DIRECTION COSINES

PARTS

1	0.0594344188	0.9953840275	-0.0753537504
	0.9673802682	-0.0388109248	0.2503380289
	-0.2462579267	0.0877744265	0.9652215723
2	0.8837869498	-0.4162946868	-0.2135868937
	0.2353116607	0.7900213939	-0.5661224422
	0.4044119802	0.4500721397	0.7961695921
3	0.9472875302	-0.3200912240	0.0137092483
	-0.2410543671	-0.7402637964	-0.6276163668
	-0.2110429512	-0.5912284838	0.7784020508
4	0.9950685242	-0.0930787353	0.0342779991
	-0.0989559677	-0.9078406198	0.4074716255
	-0.0068079836	-0.4088542016	-0.9125743220
5	0.9880176961	-0.1531935375	-0.0187822354
	-0.1439050849	-0.8703796645	-0.4708827520
	-0.0557885188	-0.4679433509	0.8819958398

WHOLE BODY

1	0.9416187098	-0.3314216117	-0.0592783318
	-0.3361052030	-0.9356175194	-0.1079497559
	0.0196849637	-0.1215712657	0.9923874896

TABLE # 101 SUBJECT 4 DENSITY 2

DIRECTION COSINES

SEGMENTS

1	0.9895492014	-0.0418454119	-0.1379903601
	-0.1199200676	-0.7702270303	-0.6263940447
	0.0800721884	-0.6363955400	0.7671956473
2	0.9974727290	-0.0448652025	-0.0550932717
	-0.0324087699	-0.9773489566	0.2091379657
	0.0632283688	0.2068239122	0.9763329569
3	0.9992668403	-0.0213186104	-0.0318009221
	-0.0023412639	-0.8630973438	0.5050321708
	-0.0382138755	-0.5045874472	-0.8625144682
4	0.8708175477	-0.2833889192	0.4017057618
	-0.2020106159	-0.9512295393	-0.2331396031
	0.4481835669	0.1218732291	-0.8855949449
5	0.9921273292	0.0875298852	0.0895649586
	0.1083096578	-0.9587524795	-0.2627978331
	0.0628679620	0.2704296623	-0.9606848688
6	0.8200932199	0.5175014103	0.2442117954
	0.5432739491	-0.5700906765	-0.6163197521
	0.1797234732	-0.6381135565	0.7486725333
7	0.9577680051	0.1820052614	-0.2226084750
	0.1566955738	-0.9794920861	-0.1266560317
	-0.2410953037	0.0864253321	-0.9666456003
8	0.9792094032	-0.0353736472	0.1997439605
	0.0232411024	-0.9586302268	-0.2837039643
	0.2015162421	0.2824478594	-0.9378776098
9	0.7054655719	-0.5344848789	0.4654505785
	-0.6892601357	-0.6703153642	0.2749505006
	-0.1650417890	0.5147846411	0.8412835320

TABLE # 101 (CONTINUED)

10	0.7571531104	0.0446287621	0.6517111638
	-0.3570307508	0.8637383765	0.3556473816
	-0.5470358402	-0.5019604473	0.6699160387
11	0.8802668324	0.4735816171	0.0291677173
	0.4578128028	-0.8638905521	0.2100013130
	-0.1246504768	0.1715038362	0.9772659274
12	0.7703309013	0.2581323431	-0.5830591701
	0.1221379873	0.8377314894	0.5322483103
	0.6258375304	-0.4812209941	0.6138026884
13	0.7713868686	0.1168244863	0.6255512276
	-0.3916557740	0.8619315269	0.3219934745
	-0.5015656025	-0.4933822882	0.7106376461
14	0.9967686758	0.0231134735	-0.0769283711
	-0.0006241896	-0.9554487080	-0.2951565291
	-0.0803232054	0.2942508006	-0.9523469163
15	0.7168966987	0.3851592343	-0.5811294930
	0.6039912668	-0.7594378418	0.2417616886
	0.3482149811	0.5243152951	0.7770712955
16	0.9971498173	-0.0396730284	-0.0641739252
	-0.0259608465	-0.9790654720	0.2018832238
	0.0708397932	0.1996418103	0.9773049019

TABLE # 102 SUBJECT 4 DENSITY 2

DIRECTION COSINES

PARTS

1	0.9951349525	-0.0618879561	-0.0766570756
	-0.0403205654	-0.9657643651	0.2562683028
	0.0898925935	0.2519306887	0.9635612330
2	0.8827437534	-0.4216297796	-0.2073446282
	0.2378535426	0.7815765410	-0.5766834511
	0.4052026137	0.4597460598	0.7902179461
3	0.9467021662	-0.3219651863	0.0096657790
	-0.2427436546	-0.7328424072	-0.6356237286
	-0.2117322050	-0.5994000542	0.7719385004
4	0.9950539974	-0.0932856856	0.0341368289
	-0.0991133910	-0.9093948450	0.4039524126
	-0.0066391216	-0.4053378798	-0.9141428364
5	0.9879631209	-0.1536593318	-0.0178236211
	-0.1441267783	-0.8725231958	-0.4668305310
	-0.0561813446	-0.4637802094	0.8841671640

WHOLE BODY

1	0.9477081190	-0.3135954366	-0.0592218144
	-0.3185032941	-0.9410959225	-0.1135522625
	0.0201239368	-0.1264767440	0.9917654261

TABLE # 103 SUBJECT 4 DENSITY 3

DIRECTION COSINES

SEGMENTS

1	0.9895492014	-0.0418454119	-0.1379903601
	-0.1199200676	-0.7702270303	-0.6263940447
	0.0800721884	-0.6363955400	0.7671956473
2	0.9974727290	-0.0448652025	-0.0550932717
	-0.0324087699	-0.9773489566	0.2091379657
	0.0632283688	0.2068239122	0.9763329569
3	0.9992668403	-0.0213186104	-0.0318009221
	-0.0023412639	-0.8630973438	0.5050321708
	-0.0382138755	-0.5045874472	-0.8625144682
4	0.8708175477	-0.2833889192	0.4017057618
	-0.2020106159	-0.9512295393	-0.2331396031
	0.4481835669	0.1218732291	-0.8855949449
5	0.9921273292	0.0875298852	0.0895649586
	0.1083096578	-0.9587524795	-0.2627978331
	0.0628679620	0.2704296623	-0.9606848688
6	0.8200932199	0.5175014103	0.2442117954
	0.5432739491	-0.5700906765	-0.6163197521
	0.1797234732	-0.6381135565	0.7486725333
7	0.9577680051	0.1820052614	-0.2226084750
	0.1566955738	-0.9794920861	-0.1266560317
	-0.2410953037	0.0864253321	-0.9666456003
8	0.9792094032	-0.0353736472	0.1997439605
	0.0232411024	-0.9586302268	-0.2837039643
	0.2015162421	0.2824478594	-0.9378776098
9	0.7054655719	-0.5344848789	0.4654505785
	-0.6892601357	-0.6703153642	0.2749505006
	-0.1650417890	0.5147846411	0.8412835320

TABLE # 103 (CONTINUED)

10	0.7571531104	0.0446287621	0.6517111638
	-0.3570307508	0.8637383765	0.3556473816
	-0.5470358402	-0.5019604473	0.6699160387
11	0.8802668324	0.4735816171	0.0291677173
	0.4578128028	-0.8638905521	0.2100013130
	-0.1246504768	0.1715038362	0.9772659274
12	0.7703309013	0.2581323431	-0.5830591701
	0.1221379873	0.8377314894	0.5322483103
	0.6258375304	-0.4812209941	0.6138026884
13	0.7713868686	0.1168244863	0.6255512276
	-0.3916557740	0.8619315269	0.3219934745
	-0.5015656025	-0.4933872882	0.7106376461
14	0.9967686758	0.0231134735	-0.0769283711
	-0.0006241896	-0.9554487080	-0.2951565291
	-0.0803232054	0.2942508006	-0.9523469163
15	0.7168966987	0.3851592343	-0.5811294930
	0.6039912668	-0.7594378418	0.2417616886
	0.3482149811	0.5243152951	0.7770712955
16	0.9971498173	-0.0396730284	-0.0641739254
	-0.0259608465	-0.9790654720	0.2018832236
	0.0708397934	0.1996418101	0.9773049019

TABLE # 104 SUBJECT 4 DENSITY 3

DIRECTION COSINES

PARTS

1	0.0599588364	0.9953314136	-0.0756327648
	0.9670389534	-0.0391358116	0.2516029629
	-0.2474683831	0.0882256506	0.9648707862
2	0.8830141886	-0.4198406076	-0.2098089775
	0.2369898204	0.7846882869	-0.5728002422
	0.4051194488	0.4560681492	0.7923888411
3	0.9469376960	-0.3212177095	0.0113217893
	-0.2419885691	-0.7356713845	-0.6326366623
	-0.2115432160	-0.5963277598	0.7743659798
4	0.9950557925	-0.0932553603	0.0341673479
	-0.0990930031	-0.9090883902	0.4046466057
	-0.0066743257	-0.4060316940	-0.9138346223
5	0.9879752824	-0.1535571917	-0.0180285931
	-0.1440795526	-0.8720917051	-0.4676506607
	-0.0560885357	-0.4646248452	0.8837295001

WHOLE BODY

1	0.9441063099	-0.3242835390	-0.0591900493
	-0.3290456058	-0.9378724102	-0.1101105419
	0.0198056780	-0.1234322830	0.9921553339

TABLE # 105 SUBJECT 5 DENSITY 1

DIRECTION COSINES

SEGMENTS

1	0.9875016587	-0.1575524527	-0.0042069827
	-0.1357855930	-0.8369140183	-0.5302237251
	-0.0800171656	-0.5241680557	0.8478473345
2	0.9998091549	-0.0193806154	-0.0024587446
	0.0195237949	0.9868008560	0.1607572459
	-0.0006892831	-0.1607745702	0.9869909131
3	0.9943516772	0.0472190977	0.0950531374
	0.0027248847	-0.9066453188	0.4218848668
	0.1061005048	-0.4192429160	-0.9016529600
4	0.9224155661	0.1949003335	-0.3334117327
	0.2560718673	-0.9549108500	0.1502413635
	0.2890963892	0.2239623374	0.9307331246
5	0.9869579017	0.1603051667	0.0147089714
	0.1589041739	-0.9555430120	-0.2483687094
	-0.0257597325	0.2474667772	-0.9685538861
6	0.6069823583	-0.5153167416	0.6049967542
	-0.3889142895	-0.8564982948	-0.3393469410
	-0.6930498483	0.0293142762	0.7202933993
7	0.7125541671	0.6221751293	0.3242910227
	0.5747754060	-0.7827089162	0.2387466968
	-0.4023677318	-0.0162745505	0.9153334624
8	0.8253191603	0.0912723250	-0.5572411025
	0.1275490528	-0.9914778336	0.0265131019
	0.5500722886	0.0929573458	0.8299273517
9	0.5165381107	0.5082578311	0.6891025739
	-0.6987847233	0.7153219315	-0.0038006428
	-0.4948618906	-0.4795711746	0.7246538468

TABLE # 105 (CONTINUED)

10	0.5879758701	0.0836313556	0.8045434560
	-0.3899092053	0.9007593249	0.1913202819
	-0.7086996457	-0.4261906087	0.5622333832
11	0.3799971435	-0.9133320628	0.1463786663
	-0.9028334628	-0.3317951913	0.2735026315
	0.2012309850	0.2360857769	0.9506679739
12	0.9749680833	0.2070859599	-0.0809483890
	0.1222370270	-0.8033298254	-0.5828544422
	0.1857292268	-0.5583695880	0.8085345122
13	0.6080355168	-0.0026920115	-0.7939052609
	0.3619323759	0.8909729786	0.2741753209
	0.7066100520	-0.4540483503	0.5427175417
14	0.9578156309	-0.2759473354	-0.0802638477
	-0.2864169065	-0.9394938569	-0.1879272424
	-0.0235493700	0.2029885732	-0.9788978835
15	0.9165390143	-0.3991788865	0.0247477661
	-0.2825230986	-0.6900041632	-0.6663894908
	-0.2830846765	-0.6037801515	0.7451929915
16	0.9997933717	0.0170275123	-0.0111030475
	0.0147480201	-0.9835046427	-0.1802806524
	-0.0139896298	0.1800796534	-0.9835525450

TABLE # 106 SUBJECT 5 DENSITY 1

DIRECTION COSINES

PARTS

1	0.9997305527	0.0200713274	-0.0116603528
	0.0171690801	-0.9774481751	-0.2104763351
	-0.0156219300	0.2102194253	-0.9775294106
2	0.8794225488	-0.4757457773	-0.0167909541
	0.3311185057	0.6366571826	-0.6964396363
	0.3420182976	0.6069049243	0.7174189131
3	0.9255407600	-0.1701092824	0.3382855800
	-0.1111215182	0.7320405356	0.6721373836
	-0.3619755652	-0.6596813521	0.6586305519
4	0.9780355043	-0.2084356331	-0.0010673434
	-0.1886076834	-0.8827943697	-0.4302339394
	-0.0887338388	-0.4209853771	0.9027167984
5	0.9977711532	-0.0193811495	0.0638521482
	0.0111372642	-0.8951005087	-0.4457252974
	-0.0657927590	-0.4454429823	0.8928896138

WHOLE BODY

1	0.9990798256	0.0414073777	-0.0111772605
	0.0426915186	-0.9851121393	0.1665277973
	-0.0041153757	-0.1668517369	-0.9859734081

TABLE # 107 SUBJECT 5 DENSITY 2

DIRECTION COSINES

SEGMENTS

1	0.9875016587	-0.1575524527	-0.0042069827
	-0.1357855930	-0.8369140183	-0.5302237251
	-0.0800171656	-0.5241680557	0.8478473345
2	0.9998091549	-0.0193806154	-0.0024587446
	0.0195237949	0.9868008560	0.1607572459
	-0.0006892831	-0.1607745702	0.9869909131
3	0.9943516772	0.0472190977	0.0950531374
	0.0027248847	-0.9066453188	0.4218848668
	0.1061005048	-0.4192429160	-0.9016529600
4	0.9224155661	0.1949003335	-0.3334117327
	0.2560718673	-0.9549108500	0.1502413635
	0.2890963892	0.2239623374	0.9307331246
5	0.9869579017	0.1603051667	0.0147089714
	0.1589041739	-0.9555430120	-0.2483687094
	-0.0257597325	0.2474667772	-0.9685538861
6	0.6069823583	-0.5153167416	0.6049967542
	-0.3889142895	-0.8564982948	-0.3393469410
	-0.6930498483	0.0293142762	0.7202933993
7	0.7125541671	0.6221751293	0.3242910227
	0.5747754060	-0.7827089162	0.2387466968
	-0.4023677318	-0.0162745505	0.9153334624
8	0.8253191603	0.0912723250	-0.5572411025
	0.1275490528	-0.9914778336	0.0265131019
	0.5500722886	0.0929573458	0.8299273517
9	0.5165381107	0.5082578311	0.6891025739
	-0.6987847233	0.7153219315	-0.0038006428
	-0.4948618906	-0.4795711746	0.7246538468

TABLE # 107 (CONTINUED)

10	0.5879758701	0.0836313556	0.8045434560
	-0.3899092053	0.9007593249	0.1913202819
	-0.7086996457	-0.4261906087	0.5622333832
11	0.3799971435	-0.9133320628	0.1463786663
	-0.9028334628	-0.3317951913	0.2735026315
	0.2012309850	0.2360857769	0.9506679739
12	0.9749680833	0.2070859599	-0.0809483890
	0.1222370270	-0.8033298254	-0.5828544422
	0.1857292268	-0.5583695880	0.8085345122
13	0.6080355168	-0.0026920115	-0.7939052609
	0.3619323759	0.8909729786	0.2741753209
	0.7066100520	-0.4540483503	0.5427175417
14	0.9578156309	-0.2759473354	-0.0802638477
	-0.2864169065	-0.9394938569	-0.1879272424
	-0.0235493700	0.2029885732	-0.9788978835
15	0.9165390143	-0.3991788865	0.0247477661
	-0.2825230986	-0.6900041632	-0.6663894908
	-0.2830846765	-0.6037801515	0.7451929915
16	0.9997933717	0.0170275124	-0.0111030476
	0.0147480201	-0.9835046426	-0.1802806531
	-0.0139896299	0.1800796540	-0.9835525448

TABLE # 108 SUBJECT 5 DENSITY 2

DIRECTION COSINES

PARTS

1	0.9997165013	0.0207322067	0.0117086535
	0.0177555724	-0.9767749181	0.2135310258
	-0.0158636884	0.2132625962	0.9768661159
2	0.8778214435	-0.4788559956	-0.0112449452
	0.3339229449	0.6286290970	-0.7023680839
	0.3434020679	0.6127988201	0.7117251056
3	0.9249214199	-0.1653601230	0.3423103806
	-0.1131024916	0.7399714960	0.6630610918
	-0.3629437882	-0.6519955635	0.6657128449
4	0.9779724542	-0.2087337346	-0.0003269711
	-0.1890242241	-0.8849615730	-0.4255735623
	-0.0885422021	-0.4162610267	0.9049237737
5	0.9977500597	-0.0193145243	0.0642009938
	0.0110505891	-0.8971274447	-0.4416335952
	-0.0661264163	-0.4413494048	0.8948955246

WHOLE BODY

1	0.9991713128	0.0390374435	-0.0115223949
	0.0404249385	-0.9847653462	0.1691243249
	-0.0047446740	-0.1694499659	-0.9855273701

TABLE # 109 SUBJECT 5 DENSITY 3

DIRECTION COSINES

SEGMENTS

1	0.9875016587	-0.1575524527	-0.0042069827
	-0.1357855930	-0.8369140183	-0.5302237251
	-0.0800171656	-0.5241680557	0.8478473345
2	0.9998091549	-0.0193806154	-0.0024587446
	0.0195237949	0.9868008560	0.1607572459
	-0.0006892831	-0.1607745702	0.9869909131
3	0.9943516772	0.0472190977	0.0950531374
	0.0027248847	-0.9066453188	0.4218848668
	0.1061005048	-0.4192429160	-0.9016529600
4	0.9224155661	0.1949003335	-0.3334117327
	0.2560718673	-0.9549108500	0.1502413635
	0.2890963892	0.2239623374	0.9307331246
5	0.9869579017	0.1603051667	0.0147089714
	0.1589041739	-0.9555430120	-0.2483687094
	-0.0257597325	0.2474667772	-0.9685538861
6	0.6069823583	-0.5153167416	0.6049967542
	-0.3889142895	-0.8564982948	-0.3393469410
	-0.6930498483	0.0293142762	0.7202933993
7	0.7125541671	0.6221751293	0.3242910227
	0.5747754060	-0.7827089162	0.2387466968
	-0.4023677318	-0.0162745505	0.9153334624
8	0.8253191603	0.0912723250	-0.5572411025
	0.1275490528	-0.9914778336	0.0265131019
	0.5500722886	0.0929573458	0.8299273517
9	0.5165381107	0.5082578311	0.6891025739
	-0.6987847233	0.7153219315	-0.0038006428
	-0.4948618906	-0.4795711746	0.7246538468

TABLE # 109 (CONTINUED)

10	0.5879758701	0.0836313556	0.8045434560
	-0.3899092053	0.9007593249	0.1913202819
	-0.7086996457	-0.4261906087	0.5622333832
11	0.3799971435	-0.9133320628	0.1463786663
	-0.9028334628	-0.3317951913	0.2735026315
	0.2012309850	0.2360857769	0.9506679739
12	0.9749680833	0.2070859599	-0.0809483890
	0.1222370270	-0.8033298254	-0.5828544422
	0.1857292268	-0.5583695880	0.8085345122
13	0.6080355168	-0.0026920115	-0.7939052609
	0.3619323759	0.8909729786	0.2741753209
	0.7066100520	-0.4540483503	0.5427175417
14	0.9578156309	-0.2759473354	-0.0802638477
	-0.2864169065	-0.9394938569	-0.1879272424
	-0.0235493700	0.2029885732	-0.9788978835
15	0.9165390143	-0.3991788865	0.0247477661
	-0.2825230986	-0.6900041632	-0.6663894908
	-0.2830846765	-0.6037801515	0.7451929915
16	0.9997933717	0.0170275123	-0.0111030475
	0.0147480202	-0.9835046428	-0.1802806521
	-0.0139896297	0.1800796530	-0.9835525450

TABLE # 110 SUBJECT 5 DENSITY 3

DIRECTION COSINES

PARTS

1	0.9997277955	0.0202021188	-0.0116708739
	0.0172841299	-0.9773033005	-0.2111386222
	-0.0156714311	0.2108794284	-0.9773864501
2	0.8783277980	-0.4778678791	-0.0135118246
	0.3328574782	0.6315952524	-0.7002094946
	0.3431416304	0.6105159516	0.7138095645
3	0.9251211522	-0.1673289851	0.3408105991
	-0.1122220868	0.7370249894	0.6664835844
	-0.3627079500	-0.6548245381	0.6630593995
4	0.9779781502	-0.2087067138	-0.0004952340
	-0.1889778122	-0.8845184874	-0.4265142810
	-0.0885783503	-0.4172152358	0.9044806924
5	0.9977532838	-0.0193315535	0.0641457381
	0.0110707909	-0.8967267111	-0.4424462036
	-0.0660743692	-0.4421622966	0.8944980051

WHOLE BODY

1	0.9991372721	0.0399586059	-0.0113146518
	0.0412914485	-0.9849649608	0.1677469590
	-0.0044416010	-0.1680694373	-0.9857651528

TABLE # 111 SUBJECT 6 DENSITY 1

DIRECTION COSINES

SEGMENTS

1	0.9866750540	-0.1625135548	0.0078538134
	-0.1274836590	-0.8021861256	-0.5833055259
	-0.1010952747	-0.5745317784	0.8122148614
2	0.9993754940	-0.0240915624	-0.0258499260
	-0.0287644783	-0.9795497848	-0.1991351900
	-0.0205238116	0.1997543885	-0.9796310313
3	0.9874553726	-0.1146130722	0.1086081529
	-0.1553281361	-0.8286939609	0.5377169231
	0.0283735318	-0.5478413666	-0.8361009387
4	0.4950635019	-0.8327716922	0.2477971708
	-0.8118585100	-0.5449709022	-0.2095053113
	0.3095123403	-0.0974578088	-0.9458879884
5	0.8804241981	-0.1275900723	0.4566990309
	-0.1854027900	-0.9790751472	0.0838907713
	-0.4364390413	0.1585327396	0.8856570068
6	0.8917939575	0.4524301083	-0.0032456777
	0.4473220846	-0.8827561865	-0.1436818283
	-0.0678711272	0.1266827230	-0.9896186123
7	0.9484875068	-0.1492185010	-0.2794732340
	-0.1951316232	-0.9701068637	-0.1442786282
	-0.2495898619	0.1913805421	-0.9492514888
8	0.8569627379	-0.0071560593	0.5153286879
	-0.1703796317	-0.9476167155	0.2701727995
	-0.4864007061	0.3193295340	0.8132914618
9	0.8616225079	-0.4787304362	0.1685936633
	-0.4312133793	-0.8656648722	-0.2543213530
	0.2676969843	0.1464291587	-0.9523113073

TABLE # 111 (CONTINUED)

10	0.5896974023	0.0698507006	0.8045979452
	-0.4115298549	0.8832018008	0.2249394532
	-0.6949101757	-0.4637622868	0.5495674563
11	0.9316497011	0.3633575043	-0.0003981629
	0.3514467510	-0.9008311474	0.2549282744
	-0.0922714240	0.2376437837	0.9669598836
12	0.8845643601	-0.0698911160	-0.4611519540
	-0.2869790670	-0.8609609386	-0.4199872347
	0.3676804426	-0.5038466970	0.7816326490
13	0.6248043775	-0.1098286984	-0.7730182061
	0.3930299268	0.8997149624	0.1898432590
	0.6746458082	-0.4224341882	0.6053118123
14	0.7671757723	0.6393650506	-0.0515137504
	0.6334058095	-0.7424546540	0.2180783512
	-0.1011850523	0.1999335363	0.9745707600
15	0.9326890728	-0.3047681684	0.1928923457
	-0.1138424198	-0.7562117697	-0.6443474706
	-0.3422440605	-0.5790165135	0.7400060001
16	0.9992295843	-0.0380932230	0.0094416252
	-0.0392075920	-0.9795587291	0.1973004332
	-0.0017328170	0.1975186133	0.9802976052

TABLE # 112 SUBJECT 6 DENSITY 1

DIRECTION COSINES

PARTS

1	0.9988096090	-0.0487764334	0.0004737596
	-0.0473818254	-0.9678525790	0.2470148739
	0.0115899751	0.2467432773	0.9690115725
2	0.9497341987	-0.1747865937	-0.2597202313
	-0.0131528246	0.8066140857	-0.5909320773
	0.3127810018	0.5646444575	0.7637700449
3	0.9342555862	0.3160029207	0.1652533017
	-0.1437031169	0.7577346315	-0.6365435118
	-0.3263677585	0.5709469172	0.7533284170
4	0.9905512850	-0.1048096332	-0.0884482482
	-0.1320564216	-0.9029539751	-0.4089440309
	0.0370034235	-0.4167601945	0.9082630054
5	0.9802226603	0.1938965911	0.0395935373
	0.1936832943	-0.8988807764	-0.3930650473
	0.0406241032	-0.3929598730	0.9186578364

WHOLE BODY

1	0.9936332770	-0.1126593390	0.0008855443
	-0.1114090957	-0.9813763218	0.1564881097
	-0.0167607948	-0.1555904510	-0.9876794456

TABLE # 113 SUBJECT 6 DENSITY 2

DIRECTION COSINES

SEGMENTS

1	0.9866750540	-0.1625135548	0.0078538134
	-0.1274836590	-0.8021861256	-0.5833055259
	-0.1010952747	-0.5745317784	0.8122148614
2	0.9993754940	-0.0240915624	-0.0258499260
	-0.0287644783	-0.9795497848	-0.1991351900
	-0.0205238116	0.1997543885	-0.9796310313
3	0.9874553726	-0.1146130722	0.1086081529
	-0.1553281361	-0.8286939609	0.5377169231
	0.0283735318	-0.5478413666	-0.8361009387
4	0.4950635019	-0.8327716922	0.2477971708
	-0.8118585100	-0.5449709022	-0.2095053113
	0.3095123403	-0.0974578088	-0.9458879884
5	0.8804241981	-0.1275900723	0.4566990309
	-0.1854027900	-0.9790751472	0.0838907713
	-0.4364390413	0.1585327396	0.8856570068
6	0.8917939575	0.4524301083	-0.0032456777
	0.4473220846	-0.8827561865	-0.1436818283
	-0.0678711272	0.1266827230	-0.9896186123
7	0.9484875068	-0.1492185010	-0.2794732340
	-0.1951316232	-0.9701068637	-0.1442786282
	-0.2495898619	0.1913805421	-0.9492514888
8	0.8569627379	-0.0071560593	0.5153286879
	-0.1703796317	-0.9476167155	0.2701727995
	-0.4864007061	0.3193295340	0.8132914618
9	0.8616225079	-0.4787304362	0.1685936633
	-0.4312133793	-0.8656648722	-0.2543213530
	0.2676969843	0.1464291587	-0.9523113073

TABLE # 113 (CONTINUED)

10	0.5896974023	0.0698507006	0.8045979452
	-0.4115298549	0.8832018008	0.2249394532
	-0.6949101757	-0.4637622868	0.5495674563
11	0.9316497011	0.3633575043	-0.0003981629
	0.3514467510	-0.9008311474	0.2549282744
	-0.0922714240	0.2376437837	0.9669598836
12	0.8845643601	-0.0698911160	-0.4611519540
	-0.2869790670	-0.8609609386	-0.4199872347
	0.3676804426	-0.5038466970	0.7816326490
13	0.6248043775	-0.1098286984	-0.7730182061
	0.3930299268	0.8997149624	0.1898432590
	0.6746458082	-0.4224341882	0.6053118123
14	0.7671757723	0.6393650506	-0.0515137504
	0.6334058095	-0.7424546540	0.2180783512
	-0.1011850523	0.1999335363	0.9745707600
15	0.9326890728	-0.3047681684	0.1928923457
	-0.1138424198	-0.7562117697	-0.6443474706
	-0.3422440605	-0.5790165135	0.7400060001
16	0.9992295843	-0.0380932230	0.0094416251
	-0.0392075920	-0.9795587290	0.1973004335
	-0.0017328169	0.1975186136	0.9802976051

TABLE # 114 SUBJECT 6 DENSITY 2

DIRECTION COSINES

PARTS

1	0.9987283149	-0.0504129126	-0.0005396795
	-0.0486354367	-0.9662239966	0.2530726824
	0.0132795823	0.2527246061	0.9674471180
2	0.9494268157	-0.1800335384	-0.2572482201
	-0.0109941952	0.7997284585	-0.6002612101
	0.3137958721	0.5727323264	0.7573043199
3	0.9333810023	0.3205896589	0.1613139025
	-0.1462545512	0.7502499357	-0.6447748756
	-0.3277339025	0.5782277272	0.7471567337
4	0.9904267831	-0.1061112525	-0.0882903701
	-0.1329920616	-0.9048795357	-0.4043589216
	0.0369851175	-0.4122298243	0.9103288818
5	0.9801799414	0.1942377988	0.0389738375
	0.1939459591	-0.9007094178	-0.3887254940
	0.0404010818	-0.3885797502	0.9205289405

WHOLE BODY

1	0.9939179573	-0.1101105592	0.0016610254
	-0.1089422475	-0.9809454787	0.1608650196
	-0.0160835619	-0.1600675876	-0.9869750181

TABLE # 115 SUBJECT 6 DENSITY 3

DIRECTION COSINES

SEGMENTS

1	0.9866750540	-0.1625135548	0.0078538134
	-0.1274836590	-0.8021861256	-0.5833055259
	-0.1010952747	-0.5745317784	0.8122148614
2	0.9993754940	-0.0240915624	-0.0258499260
	-0.0287644783	-0.9795497848	-0.1991351900
	-0.0205238116	0.1997543885	-0.9796310313
3	0.9874553726	-0.1146130722	0.1086081529
	-0.1553281361	-0.8286939609	0.5377169231
	0.0283735318	-0.5478413666	-0.8361009387
4	0.4950635019	-0.8327716922	0.2477971708
	-0.8118585100	-0.5449709022	-0.2095053113
	0.3095123403	-0.0974578088	-0.9458879884
5	0.8804241981	-0.1275900723	0.4566990309
	-0.1854027900	-0.9790751472	0.0838907713
	-0.4364390413	0.1585327396	0.8856570068
6	0.8917939575	0.4524301083	-0.0032456777
	0.4473220846	-0.8827561865	-0.1436818283
	-0.0678711272	0.1266827230	-0.9896186123
7	0.9484875068	-0.1492185010	-0.2794732340
	-0.1951316232	-0.9701068637	-0.1442786282
	-0.2495898619	0.1913805421	-0.9492514888
8	0.8569627379	-0.0071560593	0.5153286879
	-0.1703796317	-0.9476167155	0.2701727995
	-0.4864007061	0.3193295340	0.8132914618
9	0.8616225079	-0.4787304362	0.1685936633
	-0.4312133793	-0.8656648722	-0.2543213530
	0.2676969843	0.1464291587	-0.9523113073

TABLE # 115 (CONTINUED)

10	0.5896974023	0.0698507006	0.8045979452
	-0.4115298549	0.8832018008	0.2249394532
	-0.6949101757	-0.4637622868	0.5495674563
11	0.9316497011	0.3633575043	-0.0003981629
	0.3514467510	-0.9008311474	0.2549282744
	-0.0922714240	0.2376437837	0.9669598836
12	0.8845643601	-0.0698911160	-0.4611519540
	-0.2869790670	-0.8609609386	-0.4199872347
	0.3676804426	-0.5038466970	0.7816326490
13	0.6248043775	-0.1098286984	-0.7730182061
	0.3930299268	0.8997149624	0.1898432590
	0.6746458082	-0.4224341882	0.6053118123
14	0.7671757723	0.6393650506	-0.0515137504
	0.6334058095	-0.7424546540	0.2180783512
	-0.1011850523	0.1999335363	0.9745707600
15	0.9326890728	-0.3047681684	0.1928923457
	-0.1138424198	-0.7562117697	-0.6443474706
	-0.3422440605	-0.5790165135	0.7400060001
16	0.9992295843	-0.0380932230	0.0094416252
	-0.0392075920	-0.9795587291	0.1973004331
	-0.0017328170	0.1975186132	0.9802976052

TABLE # 116 SUBJECT 6 DENSITY 3

DIRECTION COSINES

PARTS

1	0.9987931034	-0.0491148754	0.0002561809
	-0.0476401934	-0.9675090183	0.2483076950
	0.0119477441	0.2480202178	0.9686811772
2	0.9494932872	-0.1781358634	-0.2583217214
	-0.0118196853	0.8023500908	-0.5967366478
	0.3135646546	0.5696507227	0.7597205154
3	0.9336171353	0.3190927474	0.1629075297
	-0.1453891463	0.7530159286	-0.6417390493
	-0.3274462411	0.5754535861	0.7494211962
4	0.9904451420	-0.1058890234	-0.0883512045
	-0.1328507333	-0.9044988689	-0.4052560658
	0.0370013955	-0.4131214240	0.9099239450
5	0.9801879079	0.1941671739	0.0391251050
	0.1939018583	-0.9003453255	-0.3895899951
	0.0404194829	-0.3894578328	0.9201569768

WHOLE BODY

1	0.9938082413	-0.1111024589	0.0011929673
	-0.1098933303	-0.9812954546	0.1580591240
	-0.0163901040	-0.1572115592	-0.9874289292

TABLE 117 Subject 1 Density 1

Volumes and Principal Moments of Analytically Segmented Body
(Units: c.g.s.)

Parts	Volume	IPX	IPY	IPZ
1	37206.2	17953482.9	19268795.2	3358763.1
2	3294.4	1076168.1	1060818.9	46341.4
3	3198.7	1023939.2	1012537.3	41177.4
4	9298.4	6816890.4	6797673.9	216019.6
5	8924.1	6120532.6	6109138.4	205904.9
Whole Body				
1	61921.8	88728945.1	97670623.3	11728987.4

TABLE 118 Subject 1 Density 1

Comparison of Principal Moments of Segmented Body
with Analytically Segmented Body
(% Difference)

Parts	Volume*	IPX	IPY	IPZ
1	- 1.35	- 2.62	- 2.49	- 1.75
2	- 0.17	2.19	2.28	- 2.34
3	- 3.28	- 2.47	- 2.32	-10.23
4	0.73	- 0.74	- 0.75	1.30
5	- 0.03	- 0.66	- 0.65	1.62
Whole Body				
1	- 0.89	- 1.54	- 1.32	0.31

*Analytical dissection of the body was very close to the physical dissection.

TABLE 119 Subject 2 Density 1

Volumes and Principal Moments of Analytically Segmented Body
(Units: c.g.s.)

	Volume	IPX	IPY	IPZ
Parts				
1	47160.7	24394889.6	26340941.6	5258262.4
2	3682.7	1498122.9	1480907.6	49550.9
3	3348.7	1131767.4	1121669.5	41561.9
4	11521.3	10698640.4	10661091.5	283930.7
5	11978.2	10869385.6	10815057.6	320269.0
Whole Body				
1	77691.4	132070085.5	144312620.5	16498540.0

TABLE 120 Subject 2 Density 1

Comparison of Principal Moments of Segmented Body
with Analytically Segmented Body
(% Difference)

	Volume	IPX	IPY	IPZ
Parts				
1	0.27	1.91	1.98	0.23
2	- 2.28	- 3.34	- 3.52	- 2.35
3*	-14.38	-27.75	-27.82	-24.04
4	- 0.39	- 0.11	- 0.14	- 2.08
5	- 3.47	- 6.67	- 6.74	- 6.45
Whole Body				
1	- 1.27	- 2.14	- 2.05	- 1.35

*Despite the fact that the analytical and physical dissections were not the same here (observe the % difference in volume and inertial values), the whole body values compare favorably.

TABLE 121 Subject 3 Density 1

Volumes and Principal Moments of Analytically Segmented Body
(Units: c.g.s.)

	Volume	IPX	IPY	IPZ
Parts				
1	55586.7	29140792.6	32241266.6	7565151.9
2	3264.9	600467.8	608592.9	51803.5
3	3005.1	605766.1	609349.1	40061.9
4	14677.6	9945062.9	9894443.6	520641.3
5	14376.4	9658254.0	9629711.4	480465.1
Whole Body				
1	90910.6	140398799.2	155513493.7	20970910.0

TABLE 122 Subject 3 Density 1

Comparison of Principal Moments of Segmented Body
with Analytically Segmented Body
(% Difference)

	Volume	IPX	IPY	IPZ
Parts				
1	6.12	4.96	8.98	24.85
2*	-29.47	-55.56	-55.86	-43.52
3*	-34.09	-59.75	-59.23	-42.92
4	0.32	- 2.11	- 2.08	- 0.41
5	- 1.24	- 4.88	- 4.97	- 3.36
Whole Body				
1	0.17	- 0.57	- 0.52	0.03

*Despite the fact that the analytical and physical dissections were not the same here (observe the % difference in volume and inertial values), the whole body values compare favorably.

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